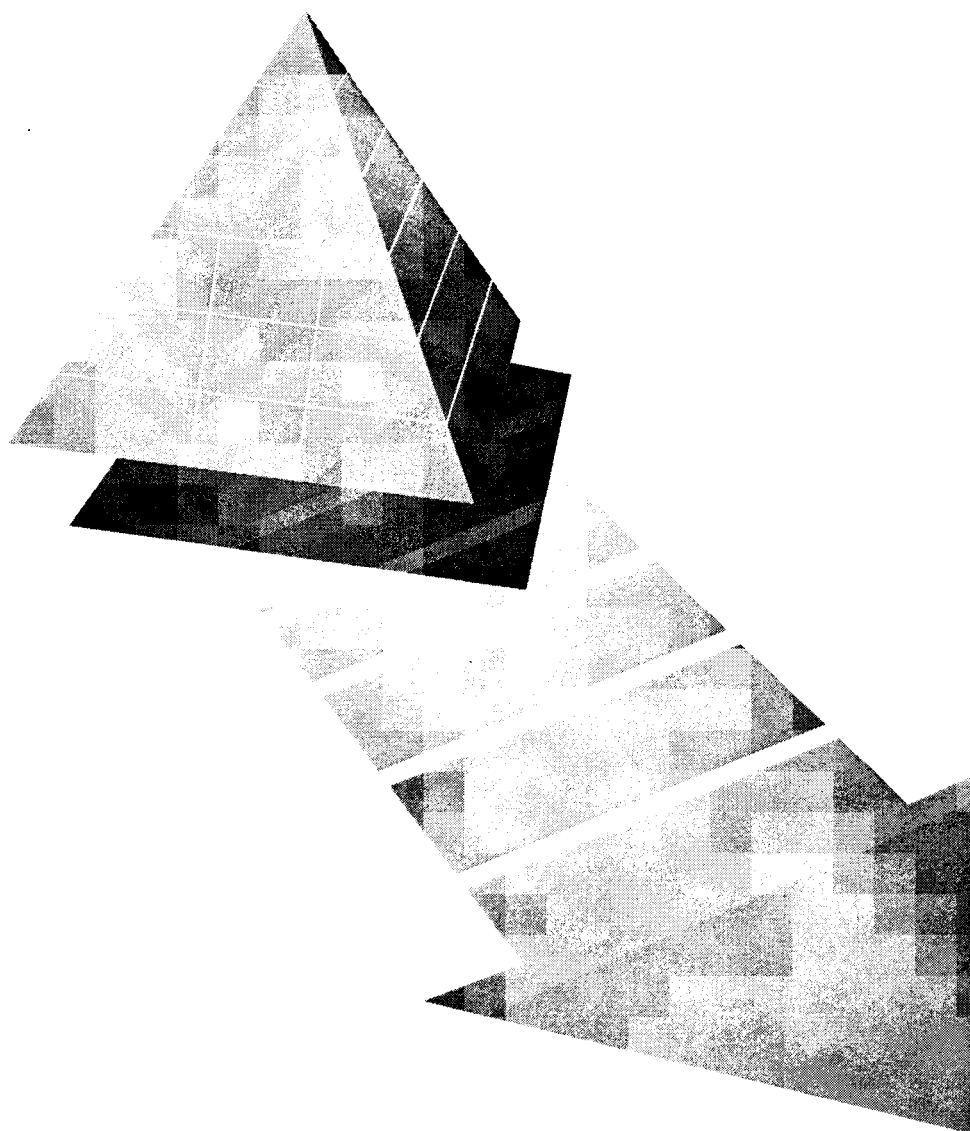


United States  
Department of  
Agriculture  
Forest Service  
Information  
Systems and  
Technology Staff  
Washington, DC  
December 1994

# Implementing the Information Management Framework

## *Implementation Master Plan*



United States  
Department of  
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Forest  
Service

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Reply to: 1390

Date: January 10, 1995

Subject: Information Management Implementation Master Plan

To: Forest Service Employees

The 90's are bringing about dramatic changes to the Forest Service. With re-invention, tighter budgets, greater demands from the public, a higher level of accountability, and revolutionary changes in technology the Forest Service along with the rest of the federal government is looking for more efficient ways of delivering services to our customers. Planning for improving the Agency's information resource and technology base has started with the development of the Information Management Framework Report and Project 615 technology procurement.

When the Information Management Framework Report was released in 1992 it was recognized that additional work would be necessary to scope out the details on how to make the Framework a reality. The Information Management Implementation Master Plan (IMP) serves this purpose in that it identifies the critical information activities that the Forest Service must carry out in order to improve our information resource.

Already work has begun on the high priority activities identified in the IMP: Project 615 Procurement is well underway, the first phase of an Agency-Wide Strategy Study has been completed, significant progress is being made to implement the National Spatial Data Infrastructure, a service-wide application prioritization and funding process is being developed, and numerous program areas of the Forest Service are analyzing their information requirements and re-engineering their business applications.

Improving the Agency's information resource cannot be done by one person or a single staff. It will require the participation of all employees with support and direction from the Agency's leadership. The IMP in support of the Framework sets the agenda for the work ahead. I fully endorse the IMP and encourage you to assist me in helping the Forest Service continue to provide quality information and state-of-the-art technology to our customers.

The improvement of our information resource and technology is critical to ensuring that, as we move into the 21st century, the Agency's role as the recognized leader in the stewardship of our Nation's natural resources and in the performance of ecosystems management is sustained.



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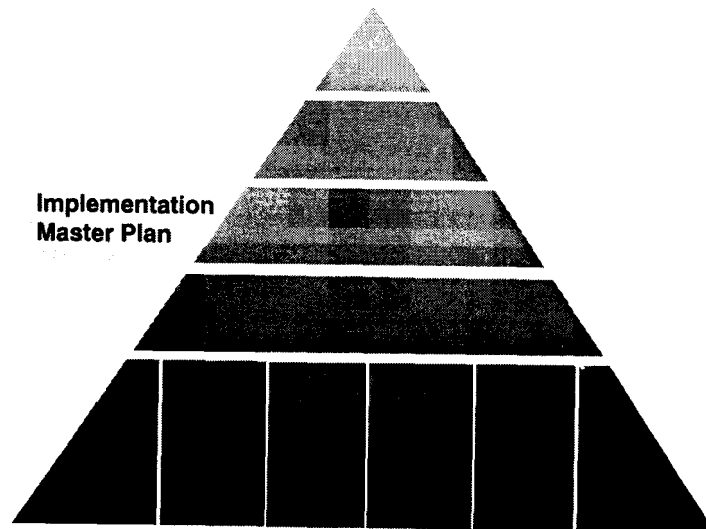
Lou Volk, Deputy Regional Forester, Region 3

# Implementing the Information Management Framework

## *Implementation Master Plan*

*“I don’t mean that I saw all this as clearly then as I do now, but at least I knew that I stood at the beginning of a long, long trail. It was probably just as well that I did not realize how rough and rocky that trail was going to be. ”*

Gifford Pinchot



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The Implementation Master Plan (IMP) is divided into six parts:

### **Executive Summary**

#### **Section 1**

Introduction provides an overview of why an IMP is needed, how it will help the Forest Service, and how it relates to other information management (IM) planning activities.

#### **Section 2**

***Achieving an Integrated Information Environment*** provides an overview of the past, present, and future of IM in the Agency. Key IM issues facing the Forest Service are also discussed.

#### **Section 3**

***Implementation Activities*** identifies specific IM implementation activities. Activities in this section are grouped based on the following IM components:

- Management Leadership and Support
- Skills Development
- Data Management
- “ Applications Management
- Technology Management
- Crosscutting (this subsection identifies *activities that apply to two or more of the IM components*)

#### **Section 4**

***Maintaining the Implementation Master Plan*** describes how the IMP will be maintained.

#### **Appendices A-B**

Acronyms/ Glossary and Bibliography include definitions and supporting references used throughout this plan.



## Executive Summary

### 1. Introduction

In 1992, the Forest Service developed and adopted a conceptual framework for the management of its information resource (***Information Management: A Framework for the Future***). The Framework described the IM environment at that time as “consisting of hundreds of development efforts that because of their functional development are not well linked. This results in an information environment characterized by:

- redundant data,
- inconsistent, incompatible information,
- inaccurate information,
- duplication with high retrieval and analyses costs,
- systems that are unable to share data electronically, and
- ‘islands’ of information in unconnected data bases and systems.”

Even though there have been numerous actions taken to improve the Agency’s information resource, the environment described in the Framework in February 1992 is, in many ways, the same environment that exists within the Forest Service today!

As part of the implementation of the IM strategies outlined in the Framework, a Chief Information Officer (CIO) was appointed to set the direction of the management of the Agency’s information resource. The CIO, after a review of the Agency’s IM initiatives, commissioned an interdisciplinary team to develop the IMP. The IMP is a strategic planning tool that addresses the activities needed to fully implement the Framework, with due considerations for the ongoing and existing body of work already accomplished in the area of IM and information technology (IT).

### 2. Achieving an Integrated Information Environment

The IMP prepared in response to Strategy 4 of the Framework, focuses attention on those activities that will help move the Agency towards an integrated, shared information environment. Specifically, the IMP describes where we have been, the current IM issues, and the actions needed to ensure that IM activities support the Forest Service mission.

The IMP focuses on the steps the Agency must take to improve its information resource by dividing IM into five emphasis or “component” areas.

- ***Management Leadership and Support:*** reflects the Forest Service leadership commitment to IM, including supporting policies and procedures.
- ***Skills Development:*** reflects the level of IM awareness, skills, and training present throughout the Forest Service.
- ***Data Management:*** reflects the level of accepted, well-maintained data standards that are in common use throughout the Forest Service.
- ***Applications Management:*** reflects the extent of software application standards and coordination that are present in the Agency.
- ***Technology Management:*** reflects the degree of sophistication of technology and telecommunications capabilities that are in place in the Forest Service.

### ***IM Issues***

Even though the Framework has been adopted, the actual implementation is only in its early stages and moving slowly. Significant issues remain, notably:

#### **Management Leadership and Support Issues**

- The commitment of the Forest Service leadership to the Framework is apparent only to a limited audience. The overall lack of responsibility and accountability for the management of the information resource is still prevalent. Better coordination of planning and execution of IM efforts is needed at both the national and local levels.
- The concept of stewardship for the information resource is not yet fully supported or implemented by the Forest Service leadership.
- Not all Forest Service management understands the IM issues facing the Agency.

#### **Skills Issues**

- The Forest Service lacks sufficient skills and expertise for the massive introduction of new technology and the effective management of the information resource.



- Products and lessons learned from IM projects are not always shared throughout the Agency, which results in valuable information not being used and the perception that things are never completed.

#### **Data Management Issue**

- The current Forest Service information environment does not adequately provide accurate, consistent, and reliable information necessary to carry out its mission. One of the visible consequences of this is the significant deficiencies in reporting to Congress as noted by the Office of the Inspector General (OIG) and the General Accounting Office (GAO).

#### **Application Management Issue**

- Establishing application sponsorship is currently very difficult in the Forest Service because any times it is unclear who should carry the sponsorship responsibility. As a result, applications are developed and then languish because no further support is provided.

#### **Technology Management Issue**

- The Forest Service needs to address the numerous issues related to the implementation of Project 615 technology such as migration to the new technology and phaseout of existing Data General (DG) equipment.

#### ***The Desired Future Condition***

The management of the information resource is not an end in itself, but a means to support the mission of the Forest Service. The following characteristics would be present in the Forest Service if the information resource were effectively used to support the Agency's mission:

##### **Ecosystems Management**

Collect, store, and administer standard, consistent information that supports the management of ecosystems at all levels of aggregation, from local to national programs and national scope. Make the information available and shareable with internal and external partners.

##### **Decentralized Organization and Distributed Workforce**

The information resource must support the work close to the ground and permit the application of management science to decisionmaking and work process design at all levels and all locations of the organization.

### **Function in the Information Age**

Meet the accountability obligation to sponsors and the public by providing accessible, reliable, and consistent information about the natural resources managed by the Agency.

### **Maintain the Information Resource**

The information resource management function needs leadership, support, and an organizational and technological infrastructure to be able to effectively meet the needs of the Forest Service. This includes mechanisms to maintain and improve a dynamic IMP and subsequent coordination of initiatives.

### **Support the Mission**

The information must be considered as the resource that enables and enhances the ability of the Forest Service to “Care for the Land and Serve the People.”

## **3. Implementation Activities**

The IMP identifies 30 major activities or projects that address the critical IM issues. The accomplishment of these activities **are key** to helping the Forest Service improve its information resource. All identified activities are national in scope and provide the foundation from which other IM work maybe tiered. For details on each of these activities, see *Section 3* of the IMP.

### ***Critical Implementation Activities***

Of the 30 activities identified in the IMP the following have been identified as the priority activities for FY 95:

- Implement Project 615 and associated telecommunications technology.
- Migrate data, applications, and technology to 615 and integrated information environment.
- Establish a Servicewide process for planning, coordinating and acquiring information assets.
- Evaluate and adopt appropriate funding mechanisms to support national IM priorities.
- Develop /acquire technical knowledge and skills (develop a national training plan).
- Develop and deploy standards for data and data structures.
- Develop procedures to manage and track changes to Forest Service information resources.
- Create and manage the Forest Service Information Management Repository (FSIMR).

## ***Barriers***

During the process of gathering information and developing the IMP several barriers to successful implementation became apparent. These barriers are:

- Few people in the Forest Service fully understand IM or its value to the Agency. Many believe that IM is either a Geographic Information System (GIS) or relief from upward reporting requirements.
- The Agency does not support the IM program nearly to the point of its being treated as a resource. This seems to be true at all levels of the Forest Service.
- Implementation of IM is expensive. No formal funding mechanism is in place presently to provide the resources to move the IM program forward.
- Some strategies of the Framework are completed, others are partially complete, and some have not yet been initiated. Many of the reports and recommendations from the completed and partially completed strategies have not been accepted, published, implemented, or institutionalized into the Forest Service.
- Information about the current state and progress of IM is not widely known throughout the Forest Service.
- Creation of national information policy and direction is seen as an effort to centralize the IM program.

## **4. Maintaining the IMP**

The IMP as with other IM activities, must be implemented, monitored, and revised as necessary if it is to be a meaningful management tool. The IMP must be flexible to reflect changing business priorities and needs, and must be aligned with the business planning process to reflect changes in mission priorities. It will be revised periodically at a minimum annually to reflect the changing business needs.

## **5. Summary**

The IMP is a tool that will allow the Forest Service to focus its efforts on a comprehensive and global approach to IM in order to achieve an integrated information environment and reap the true benefits of the deployment of new technology. The focus on a single vision and a coordinated set of implementation activities is crucial at a time of reduced funding, significant

turnover, changes in leadership, and a redefinition of the ways the Forest Service accomplishes its primary mission. This plan can be used to establish the practical framework to implement the Information Management Framework and use information as a resource to support the Forest Service mission.

## Section 1: Introduction

*“Nothing is permanent but change. ”*

Heraclitus (500 B. C.)  
*Lives and Opinions of  
Eminent Philosophers*

### 1.1 What is the IMP?

The IMP is THE strategic planning document that identifies principal activities that the Forest Service must complete in order to improve the management and use of its information resource.

Today complex organizations need to carefully guide their adaptations to the Information Age. In February 1992, the IM Framework Report (Framework) was adopted by the Forest Service. It identifies seven strategies to enable the Forest Service to achieve its vision of an integrated information environment that fully supports its mission:

1. Establish and fill the CIO position.
2. Assemble an Information Management Advisory Group (IMAG).
3. Adopt a standard IM methodology.
4. Involve interdisciplinary teams/ develop IMP.
5. Involve managers and technical staff working on IM activities.
6. Acquire technology to support the Framework.
7. Provide education, training, and awareness.

In Strategy 4 of the Framework, mentioned above, Forest Service leadership recognized the need for a coordinated, Servicewide implementation approach. The Framework states:

The CIO, with the help of the IM Advisory Group, develops and communicates an implementation plan for involving interdisciplinary ad hoc teams to move the Agency to the desired IM environment.

## **1.2 How Are the Activities Described in This Plan Related to the Forest Service Mission?**

It is important that IM efforts be closely aligned with the Forest Service mission, and therefore, that we integrate information planning with other current strategic instruments used throughout the Agency. While the business justifications for the recommended activities contained in this plan are discussed, it is beyond the scope of this report to provide a detailed discussion of all of the business issues and processes related to IM. The appropriate forum for the comprehensive discussion of the business issues and processes can be found in the Resource Planning Act (RPA), Information Resource Management Plan, and Agency-Wide Strategy Stage (AWSS) Report.

## **1.3 Why Do We Need an IMP?**

The Forest Service lacks a national implementation strategy that clearly defines the IM activities that need to be accomplished, the priority for accomplishment, and who should be responsible for these activities. As mentioned earlier, Strategy 4 of the Framework calls for development of a coordinated Servicewide IM implementation plan to address these challenges. The Framework states:

Moving to a shared-data, integrated information environment will take a well thought-out plan. Integration is not something that takes place across all systems at one time. Rather, it must proceed one or a few projects at a time. . . . Selection and prioritization of projects will be keys to success on several fronts. There should be a natural sequence of projects that produce the earliest and greatest good to doing the work of the Forest Service.

There are also several external directives that require the Agency to manage its information resource in a coordinated and planned manner. Key among them is Office of Management and Budget (OMB) Circular A-130, which states that “Agencies shall plan in an integrated manner for managing information throughout its life cycle.”

Many influences internal and external to the Forest Service bear upon how the Agency fulfills its mission. The public has a great, increasing interest in environmental issues and related information. Agents of change, such as the National Performance Review (NPR), Forest Service Reinvention (FSRIT), Departmental reorganization plans, and the Accountability Task Force, are helping us examine the way we do business and to be more cost-sensitive. To remain effective in this climate of change, the Forest Service must explore and implement different approaches to respond to the public’s needs.

## Forest Service Mission

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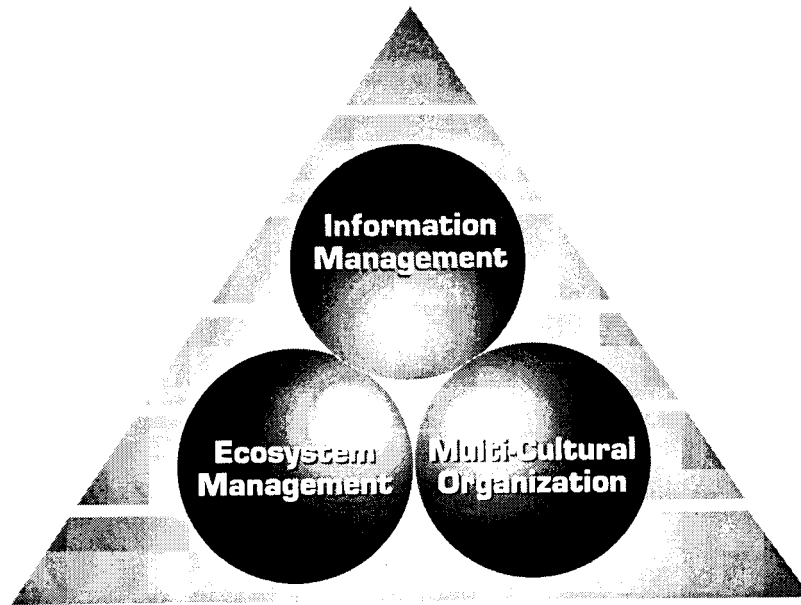


Figure 1.1

*The Forest Service mission of “Caring for the Land and Serving the People” encompasses three fundamental components: ecosystem management, multiculturalism, and IM. A blending of these components is critical if the Agency is to accomplish its mission. Figure 1.1 shows that equal attention must be given to each of these critical components in order to support the mission of the Forest Service.*

There are many IM challenges, though, facing the Agency. The Framework and its implications are not yet widely understood, accepted, or supported. Information is still being managed in an inefficient manner as evidenced by the redundancies, fragmentation, and functionalism in our IM activities. Some of the IM activities that resulted from the Framework, so far, have focused too much on process to the detriment of delivering on-the-ground products to end-users.

It would not be accurate, though, to say that there have not been successes. Some of the significant successes that have occurred are listed below. The related Framework strategy is listed to reflect the accomplishment of Framework objectives:

- Appoint a CIO (Strategy 1),
- Establish the IMAG (Strategy 2).
- Adopt a Forest Service Information Methodology (Strategy 3).
- Conduct numerous IM projects using interdisciplinary teams to

deliver information products such as the AWSS, IM Support Structure (IMSS), Integrated Personnel System (IPS), Resource Management Information Project (RMIP), Fire and Aviation Management Strategy Project (FAM), Integrated Applications Project (IAP), Infrastructure Project, Automated Lands Project (ALPS), Money Focus Area Project, and District Production Data Base (DPD) pilot efforts. See Appendix D of the AWSS Report for a further listing of national and local projects (Strategies 4 and 5).

- Prepare for the renewal of our technology platform with Project 615 (Strategy 6).
- Communications and skills development efforts, such as the “Preparing People” training team and IM Education Consortium (IMEC) (Strategy 7).

The IMP builds on these successes and also addresses areas that need attention. It provides a focus for national and local IM activities by identifying critical activities that must be completed and the desired results. The IMP promotes organization action by proactively providing a “road map” of where the Agency needs to go. It will serve as a tool to help the Forest Service obtain maximum benefit from its information resource in a more cost-effective way.

#### **1.4 What Are the Desired Outcomes? How Will We Recognize Success?**

The IMP will be a success when the Agency is working in concert to manage its information resource. Units throughout the Forest Service will use the IMP to guide national and field IM decisions. Specifically:

- Redundant IM efforts will be minimized or eliminated.
- Intra- and interagency data sharing will be common place.
- IM priorities will be clear to all interested parties.
- Resources will be allocated to projects that directly contribute to our mission and that are in-line with integrated information strategies.



## **1.5 How Should We Use the IMP?**

Since the IMP identifies those activities required to achieve an integrated information environment, it should serve, along with the IRM plan, as the basis for IM planning. Each activity identified in Section 3 of this plan is a measurable effort with specific outcomes. Actions or steps to complete the activities have been identified along with other critical information such as activity priorities.

The planning horizon for the IMP covers a 5- to 8-year period. It will be revised periodically by the CIO and IMAG, and approved by the Chief and Staff as needed. The IMP is a working document that must be adaptable to change. Input will be utilized from interested parties, inside and outside the Forest Service, to ensure successful implementation.

## **1.6 What is the role of the CIO?**

It is important to note the CIO'S leadership role in this implementation effort. The Framework states that:

The CIO has leadership responsibility for IM functions [Servicewide]. With the assistance of the IMAG, the CIO proposes policy, sets priorities, plans and supports interdisciplinary involvement, and coordinates decisionmaking necessary to achieve the integrated information management environment.

Clearly the CIO does not have all the resources necessary in his immediate staff to accomplish this implementation. As the IM advocate for the Forest Service, the CIO serves primarily as the facilitator for IM. The CIO, in conjunction with IMAG, must coordinate and collaborate with all interested parties in the Agency to gather the necessary resources to carry out the activities described in this plan. For example, management systems (MS) directors play a key role in sharing responsibility and leadership with the CIO to provide expertise, technology and support for IM activities. The matrix in Figure 1.2 provides additional information on key information management roles and the functions they perform.

## **1.7 What Is the Relationship of This Plan to Other IM Planning Activities?**

The IMP is not an end in itself, but an integral part of a coordinated Servicewide IM strategic planning process. Figure 1.3 provides the context for various planning efforts as described in the IMF Report.

	CIO/Mgmt. Systems (MS)	User Lead w/ MS Support	MS Lead WI User Support	Ussr
Strategic Information Plan			X	
Repository Management	X			
Data Administration	X		X	
Data Standards		X		
Metadata Standards			X	
Technology Architecture Standards	X			
Information Engineering Methodology	X			
Hardware and Network Acquisition	X	X		
Systems Programming	X			
Computer Operations	X			
Application Development		X		

Figure 1.2 Key IM Roles and Functions (NOTE: Figure 1.2 does not portray all IM functions)

There are essentially two aspects of the planning process: strategic planning that is long-term and focuses on what needs to be done, and operational/ tactical planning that is near-term and describes how strategic objectives will be accomplished. Outputs such as the Information Resources Management Plan (IRM Plan) and IMP are derived at different points in this planning cycle. The following are some general characteristics of the Agency's information management planning cycle:

### ***Strategic***

#### **Department/Agency Strategic Business Planning**

- Description of mission, vision.
- Description of Department / Servicewide reinvention and reengineering efforts.
- Description of current and future business requirements, products, and services.
- Corporate business goals, critical success factors, risks.

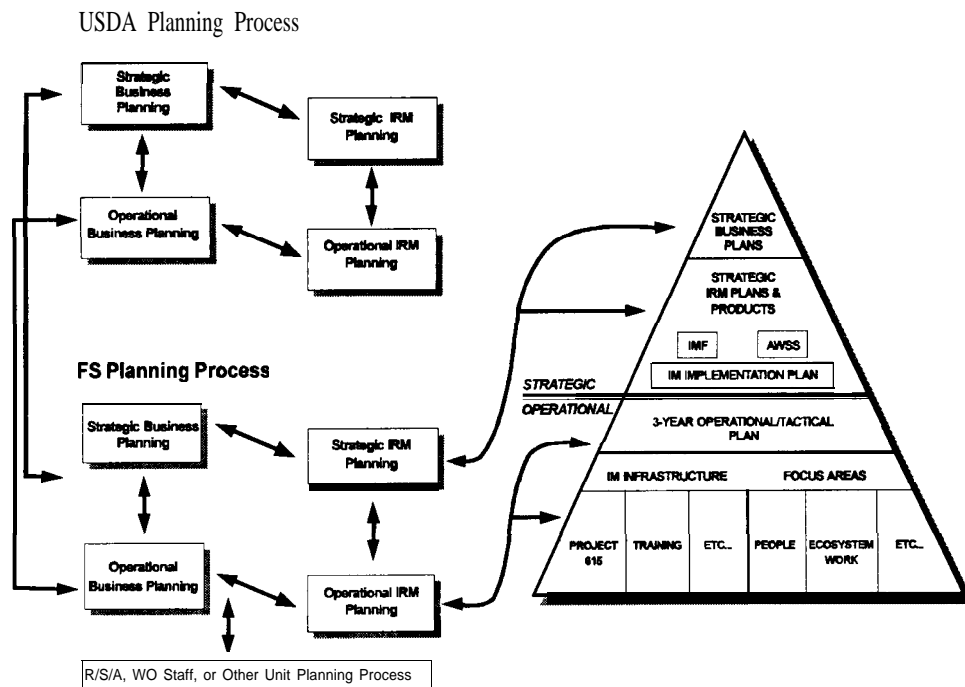


Figure 1.3 Information Management Planning Cycle

### Department/Agency Strategic IRM Planning

- Description of IRM mission and vision.
- Description of how information systems will serve the Agency mission and satisfy business requirements identified in the strategic business plan.
- Description and application of current and future information infrastructure and environment.
- Corporate IM goals, critical success factors, risks.

### Forest Service Information Management IMP

- Identification of strategies, activities, and projects related to corporate IM goals from the Strategic IRM Plan.
- Description of the process to prioritize IM activities.

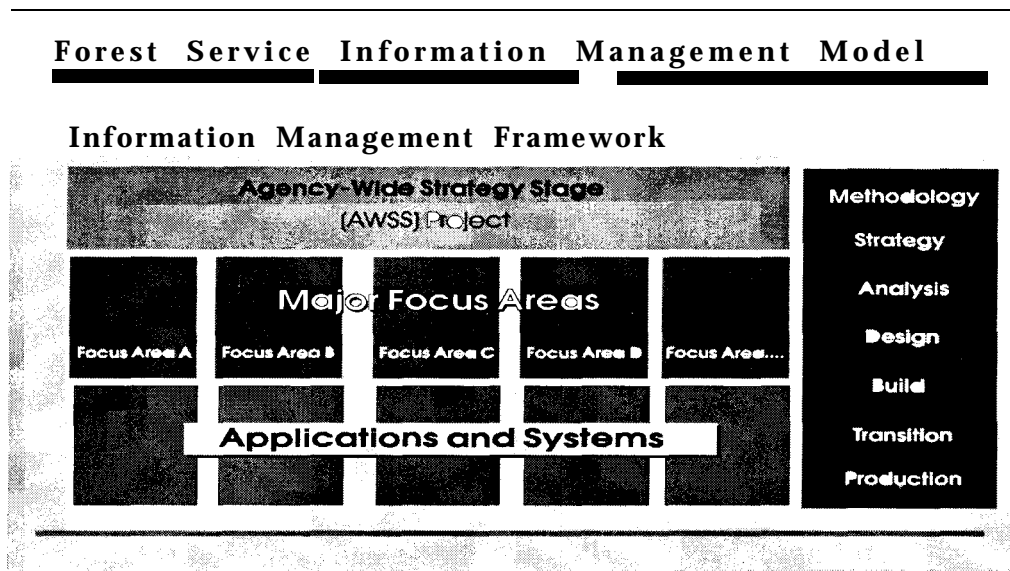
## ***Operational/Tactical***

### Department/Agency Information Management Operational/Tactical Planning

- Identification of prioritized IM activities into national IM program funding alternatives.
- Identification of selected alternatives (National Program of Work).
- Identification of sponsors, accountability, timeliness, required resources, products, and dependencies.

Management Activity 2 in Section 3 of this plan identifies the need to define, establish, coordinate, and internalize the IMP and other plans as part of the Servicewide planning process. The 3-Year Operational/Tactical Plan (described in the Framework and covered in Management Activity 4) will prioritize, budget, identify resource requirements, and implement the selected national activities listed in the IMP.

The logical outcome of the IM Planning Cycle is information and technology solutions that allow the Forest Service to accomplish its mission in an efficient and effective manner. The Forest Service IM Model (Figure 1.4), based on the Forest Service Information Engineering Methodology (FSIEMj), is a further breakdown of the IM Planning Cycle and portrays the key components that lead to integrated applications and systems.



*Figure 1.4 Forest Service Information Management Model*

The IMP identifies and prioritizes needed IM activities while the Agency-Wide Strategy stage (called for by the Framework) provides the Enterprise Model by which applications are ultimately produced to meet users' needs. The use of the FSIEM in this process is a critical tool in the delivery of information resources because it ensures that the necessary planning, coordination, and customer interaction occurs.

### **1.8 What Differentiates the IMP from Other Plans?**

There are few new recommendations in this plan. Many recent planning efforts have consistently recommended similar actions. What the IMP does differently is:

- It provides a context for the Agency's IM efforts.
- It provides a comprehensive picture of the key IM activities.
- It identifies redundant efforts and missing activities in the planning process.
- It prioritizes the activities that need to be completed first.

Various reports, studies, literature, interviews, site reviews, and current programs were used to develop the IMP. See the bibliography in appendix B for a complete listing of information sources consulted.

### **1.9 What Are the Critical Success Factors?**

If the Forest Service is to accomplish its mission, it must manage its information resource efficiently. The Framework, IMP, Project 615, AWSS, and other efforts are steps in the right direction. In addition:

- Forest Service leadership must support IM efforts with adequate budgets, personnel, and other resources to achieve an integrated information environment.
- Necessary skills must be available to support the IM program.
- IM projects must contribute to accomplishing the Forest Service mission.
- Forest Service work processes and technology should be consistent throughout the Agency so that employees can work at any Forest Service site with little or no retraining.

- Data must be based on a cross-functional business model and data standards so that it is consistent, shareable, and easily accessible to all business functions.
- Good IM practices must be rewarded and bad IM prohibited.

***"The only way to predict the future is to have the power to shape the future."***

Eric Hoffer  
*The Passionate State of Mind*

---

This section lays the groundwork for implementing the Framework and this plan by discussing the past, current, and the desired future condition of IM in the Forest Service. To provide further clarification, the components that make up IM and the IM maturity model are also introduced. Finally, the major IM issues that the Agency faces are briefly described.

## **2.1 How We Got Here**

The following are some of the milestones along the path taken by the Forest Service to improve its IM capabilities:

- Prior to 1983:** Mainframe technology and the "Blueprint for Action"
- 1983:** Acquired Data General (DG) and office automation software
  - National Systems Management Review (SMR) called for a national coordination of information systems development
- 1985:** Tomlinson Study—Information Needs Analysis for Geographic Information System (GIS)
- 1986:** National Information Requirements Project for streamlining upward reporting and budget tracking requirements
- 1987 to 1989:** Controlled GIS evaluation and other GIS experience
- May 1988:** National GIS Plan to acquire technology to meet GIS needs
- June 1988:** Resource information project to compile all common data attributes used in the Agency

- 1990 to 1994:** Business strategy studies in Personnel, Fire and Aviation Air Resources, DPD Projects, Integrated Resources Inventory Infrastructure, Money Focus, Contact Management System, ALP, etc.
- February 1992:** "IM: A Framework for the Future"
- March 1992** GIS Evaluation Report
- March 1992:** Methodology adopted based on Methodology Consensus Report
- May 1992:** 615 Project (begin procurement process to acquire technology to meet GIS needs and replace DG functionality)
- August 1992:** IMAG selected
- October 1992** Repository Team Report
- February 1993:** CIO selected (Bill Bristow)
- August 1993:** IMSS Report
- October 1993:** Open Systems Environment Conference
- March 1994:** National Telecommunication Plan completed
- 1994:** AWSS study completed
- 1995:** Pilot 615 evaluation

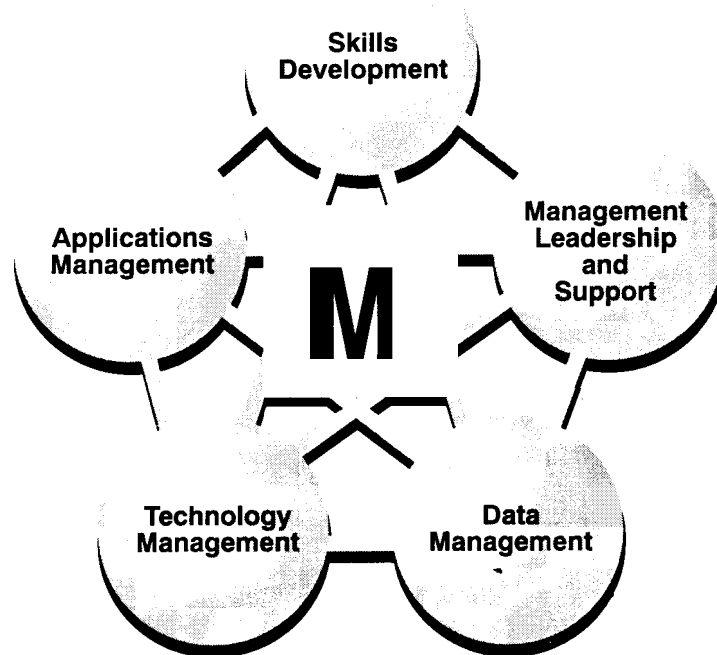
The major milestones of the Forest Service in the early 1980's emphasized principally technology, telecommunication, and office automation. Examples include mainframes, DG's, office automation software, telecommunications between units, and limited functional applications and data bases. In the late 80's and early 90's, there have been increasing IM emphasis and activities. They have been greatly accelerated due to advances and introduction of complex software tools and methods such as GIS, computer-aided systems engineering (CASE), and relational data base management systems (RDBMS). With the award of 615 and movement into open systems, even more challenges and opportunities lie ahead. But more significant to IM are the deliberate organizational and cultural changes as well as the numerous national efforts and studies that have taken place to advance IM within the Agency.



## 2.2 Current Situation and the Maturity Model

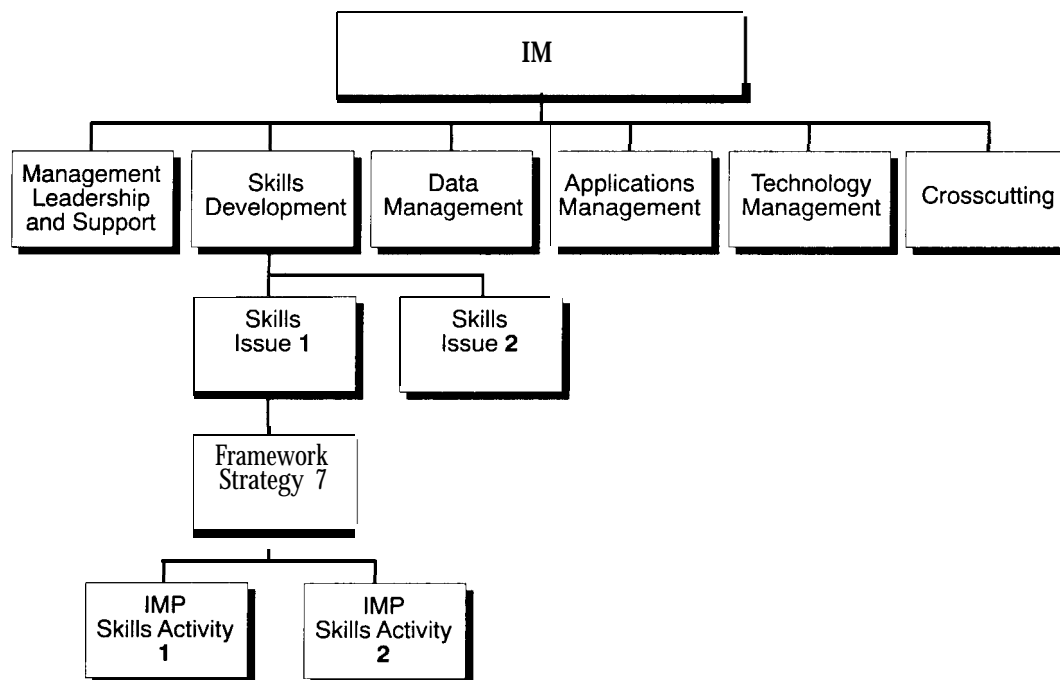
IM can be defined as “a structured process to bring quality information in the right form to the right people at the right time to support sound and deliberate decisions, and to generate ideas.” In the context of this document it is further defined in terms of emphasis areas or components (see Figure 2.1). These components are:

- **Management Leadership and Support**  
*Management leadership and supporting policies and procedures.*
- **Skills Development**  
*Level of skills throughout the Agency.*
- **Data Management**  
*Level of accepted, well-maintained data standards and data in use*
- **Applications Management**  
*Extent of coordinated applications and application standards.*
- **Technology Management**  
*Availability of the necessary technology and telecommunications to support the business.*



*Figure 2.1 Information Management Components*

These components are referenced throughout the IMP. For example, the issues discussed in Section 2.3 are grouped on the basis of their relationship to each of these IM components. The associated Framework strategy also is noted for each issue in Section 2.3. Activities described in Section 3 are derived from these major issues. See Figure 2.2 for a graphic description of the relationship between components, issues, activities, and Framework strategies.



*Figure 2.2 Information Management Relationships*

An organization's management approach to its information resource progresses through several stages. The information management maturity model developed by Richard Nolan, a Harvard University researcher, describes six stages of an organization's IM maturity:

- **Initiation**— Computers are first introduced into the workplace.
- **Contagion**— A data processing department is established and data processing practices begin to spread throughout the organization.
- **Control**— The cost of computing is recognized and controls are established throughout the organization.

- **Integration** —Shared data bases replace stand-alone application data bases.
- **Data Administration**- An IRM planning methodology is introduced that treats information as a resource.
- **Mature**- Integrated information is commonly used throughout the organization as a management tool.

This model is useful in helping assess the Agency's progress in various IM areas. Progression through these stages is iterative, based on changes in policy business strategy, technology, and other factors. Figure 2.3 shows the stages of IM maturity within the Forest Service.

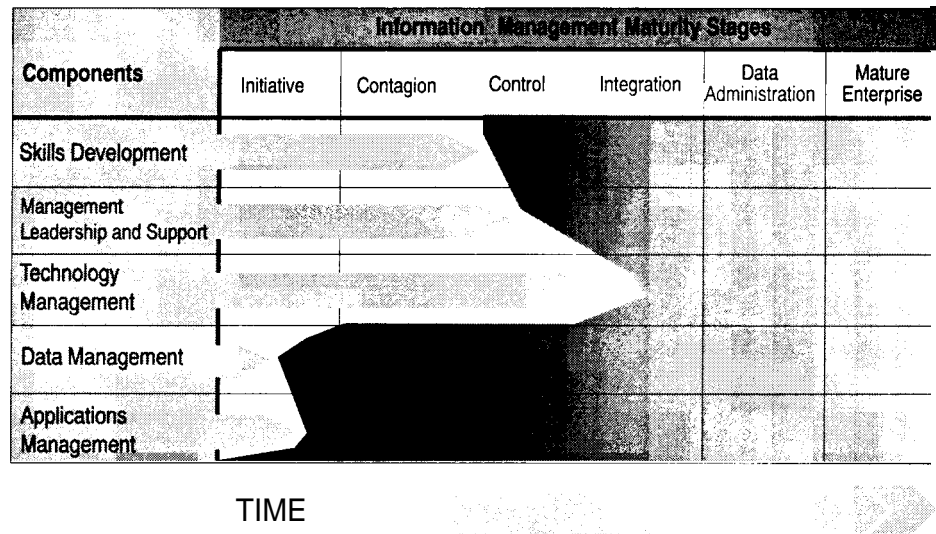


Figure 2.3 Information Management Maturity

While this assessment was developed by the IMP team, it is supported by numerous examples throughout the Agency. The shaded area in Figure 2.3 represents the difference between the current state of IM maturity within the Agency and the desired state. Technology management is at a much more mature stage compared with the other four components. This is depicted by the large indentation on the left edge of the shaded area for that component. The exact rating for each component is not as important as the component's

rating relative to the others. Since the technology component is at a more mature stage, much of the effort addressed in the IMP is concerned with moving the remaining four components ahead at an accelerated rate so that all components might reach maturity at about the same time.

## **2.3 IM Issues**

The Framework, while recognizing the Agency's past accomplishments and successes, depicts the present environment as one that "consists of hundreds of development efforts that are not well linked." This results in an information environment that is "characterized by redundant data, inconsistent [and] incompatible information, inaccurate information, duplication, and 'islands' of information in unconnected data bases and systems." Unconnected local and functional data bases exist individually supporting separate Forest Service plans and programs. This approach serves a functional need but has been a barrier to interdisciplinary, multifunctional program development and implementation.

Consequently the Forest Service is seen as not organized effectively to support IM. Needs for information by users often cannot be accommodated because data are in different forms or have not been collected. Current methods are susceptible to high risk that data will be combined or used inappropriately, resulting in inaccuracies that affect the Agency's credibility and decisionmaking. The Forest Service is left with inconsistent interpretations, cumbersome processes, and an information resource that is difficult to manage. In this environment, having multiple information standards is tantamount to having no standards at all.

A lack of responsibility and accountability for the management of the information resource also has been a significant issue. The decentralized functional nature of the Agency is seen as an additional impediment to national IM goals. Because of this, numerous application development efforts are found at all levels of the Forest Service when some of this activity could be better coordinated and concentrated at the national level. But this is not a simple issue with easy solutions. There is the constant tension to meet local needs "now" and the long-term national IM goals. Both are legitimate. For example, from a national perspective, activities are directed toward planning and coordination that result in a shared information environment Servicewide. From a field perspective, there are jobs to get done, trees to measure, acres to add up, maps to draw, and so forth. The need is to move quickly. The former timeframe is measured in months or years; the latter in hours, days, or weeks. Often, each of these perspectives is difficult to view or resolve from the vantage point of the other.

In the following section, IM issues and challenges are summarized under each IM component. The issues are covered in greater detail under each activity in Section 3.

## **Skills Development**

### ***Issue 1:***

There is a lack of understanding of IM concepts (Framework vision, ethics, principles, and methodology) in many quarters of the Forest Service. Technical skills required to develop and manage integrated information systems are also scarce and poorly utilized. There is widespread misunderstanding of how integrated IM can benefit an employee's daily work or support the Agency's mission since there are very few working examples. The Forest Service needs to clearly define and deploy the skills and knowledge necessary to achieve an integrated information environment. New skills will be needed by all employees to address their specific job requirements.

To reach and function in an IM environment that supports the business, a Servicewide commitment to communication and training is needed. Awareness and training plans for acquiring, sharing, and improving IM skills and communicating IM benefits must be developed (*Framework Strategy 7*).

## **Management Leadership and Support**

### ***Issue 1:***

Currently much of the Agency's business planning continues to be conducted in a functional manner. This is driven by tradition, functional budgets, and a decentralized functional organization. Information systems also reflect this functional approach. Each functional area presently has to secure the resources for their IM activities. Those who have strong management support will secure the resources, while others who have potentially greater IM needs cannot secure the necessary resources. Integrated data bases and applications, however, are not necessarily bound by functional or programmatic considerations. Those IM efforts that support Forest Service business strategies and have the greatest benefit to the Agency should be funded first.

Cross- and multifunctional programs, such as ecosystem management, are providing the major impetus for change in the Agency's functional approach. Embracing information as an important resource should broaden programming and funding beyond the traditional functional lines (*Framework Strategies 4, 5*).

**Issue 2:**

Severe deficiencies in national coordination, clear roles and accountability, a Servicewide comprehensive planning process, setting priorities, update of Forest Service manuals and handbooks, and adequate funding of national activities over the full life cycle in IM leads to inconsistency redundancy of efforts, and less than optimal use of limited resources. In addition, the “task force” approach to major projects becomes ineffective without a followup mechanism to incorporate the results of projects into the daily work of the organization. The inability of the Agency to implement and support critical IM efforts results in poor credibility and increases reluctance by some to depend on corporate agreements and standards (*Framework Strategies 4, 5*).

## **Technology Management**

**Issue 1:**

As Project 615 technology is implemented, systems configuration and distribution need to be done in a systematic and comprehensive manner. Pilot sites need to determine the correct configuration and system sizing for Forest Service sites depending on the number of users, location, and distribution of applications and data needed. In other words, in an integrated IM environment, business objectives and needs should drive the development of information architectures (i.e., data and applications architectures), which in turn should drive the technology architecture and not the reverse as traditionally has been the case.

As this new technology is placed, considerable numbers of the legacy systems, DG equipment, personal computers, workstations, and such, could lose or extend their usefulness depending on their particular circumstances. A process for handling surplus systems or incorporating their extended use needs to be established to maximum benefit of the Agency.

Implementation of Project 615 is slated to take about 5 to 8 years, similar to the life expectancy of this plan. By the time it is fully installed, the next wave of technology will be on the horizon. Over time, the Agency must manage and track its technology systems on a lifecycle basis (*Framework Strategy 6*).

**Issue 2:**

Telecommunications is an integral part of the information systems infrastructure of the Forest Service. The transition of the Forest Service distributed processing system from a proprietary system to an open systems environment, along with the rapid changes taking place in the

telecommunications industry, provide many opportunities and challenges to effectively utilize telecommunications in achieving management needs.

In March 1994, the Forest Service completed a National Strategic Telecommunications Plan. This plan was completed in a joint effort with the Institute for Telecommunication Sciences, National Telecommunications and Information Administration, U.S. Department of Commerce.

The Forest Service information system infrastructure needs to continue to evolve as open systems technology is implemented. Doing this within the overall framework of the National Strategic Telecommunications Plan will provide the Forest Service a strong infrastructure on which to base its IM activities (*Framework Strategy 6*).

***Issue 3:***

New technological innovations and methods appear on the market frequently. These need to be evaluated in light of emerging Agency business needs and for efficiency improvements as part of the overall IM planning process. When such innovations are seen to benefit the Forest Service, they must be evaluated and adopted into the corporate architecture quickly (*Framework Strategy 6*).

## **Data Management**

***Issue 1:***

The enterprise model, a national repository of existing national efforts, model reconciliation, change management procedures, naming conventions, definition standards, quality assurance, security standards, and lifecycle management of data and data structures are not currently in place within the Agency. Accelerated implementation and application of the FSIEM as recommended in Strategy 3 in the Framework, the Methodology Consensus Report, and Repository Report will address some of these deficiencies. Specifically development of the strategic model of the Forest Service business—the "enterprise model"—was initiated through the AWSS and needs to be completed by Phase 2 AWSS and the follow-on Focus Area Strategy Stage (FASS) efforts (*Framework Strategies 3, 4*).

## Applications Management

### **Issue 1:**

There are more than 500 nationally and regionally supported applications that support the Agency in conducting its business. There are a like number of data bases that these activities access. The wide range of data and applications in support of the Forest Service mission represents a massive workload for transition to an integrated information environment. To accomplish this transition, work must be organized into projects and prioritized according to mission criticality. Applications being migrated will be required to conform to data standards and programming guidelines (*Framework Strategies 3, 4, 5*).

### **Issue 2:**

A variety of computer software that is used daily in conducting Forest Service business was obtained locally or nationally through purchase, contract, or developed within the Agency. Many locations lack important software functionality to improve or even conduct their work, and user assistance and programming expertise often are not available. More national coordination of application development efforts is needed. Because of limited data and application standards, applications developers are operating in a vacuum when trying to meet user needs.

In an IM environment, national applications should be coordinated, prioritized, developed following national standards and guidelines, well-documented, and widely used and supported in a lifecycle process (*Framework Strategies 3,4, 5*).

## **2.4 Desired Future Condition**

To be successful, the principal goals of IM cannot be only integration of data or acquiring new technology for the additional efficiencies it may bring, since there is no end in sight to integration or technological advances, but primarily emphasis and flexibility in the support of, and as a result of, major business objectives that management deems important. In addition, the Agency needs to develop a clear picture of how business processes currently work, suggest ways to look at processes differently, and the role IM and technology can play in enabling a different construction of these processes. For example, the Forest Service Reinvention Team is providing an opportunity and a framework in which these processes can be explored and implemented. Given the above proviso, IM professionals who cooperate closely with other professionals within and outside the Agency must focus on supporting the following business goals and objectives:



### ***Ecosystem Management and Mission-Based Work***

Successful accomplishment of ecosystem management requires that all IM functions:

- Collect, store, and administer natural resource information in a standard manner.
- Integrate functional information.
- Provide technology capable of active interchanges of information between and among projects, programs, internal staff, and external partners. The need for standards and open systems is critical
- Aggregate information from land bases to allow for analysis of data at all levels.

### ***Support a Decentralized Organization***

The focus on the primary mission of the Forest Service will require the Agency to continue working close to the land. At the same time, there will be the need to capture and analyze consistent information across the Agency and to achieve economies of scale in technology deployment and use. The Forest Service must be able to support a decentralized organization with a distributed workforce and a decentralized management structure through an information architecture which is itself decentralized and distributed.

The distribution of information must be counterbalanced by a strong set of core, Servicewide requirements for standards in IM. This will facilitate usable information, rather than information fragmented by the decentralized organization. The achievement of consistent, integrated information will require a strong commitment by the entire Agency.

### ***Support a Performance- and Results-Driven Agency***

The Government Performance and Results Act of 1993 (GPRA) and shrinking budgets require a more cost-effective approach to all Forest Service activities. As a result, coordination, planning, and monitoring of IM activities will be imperative for performance measurement, accountability, and cost savings. Standards for data and applications management will be one of the tools necessary to manage the information resource and deliver results.

### ***Function in the Information Age***

The Government has an obligation to make its information available to outside interests and the general public. The ability of the Forest Service to do this is impaired when inconsistent, incomplete, or fragmented data are offered to the public. Information must be consistent, reliable, complete, and integrated, and meet uniform standards. Making information available begins by internally defining the information standards and IRM policies and procedures, and working with external partners for accuracy, consistency, and uniformity of standards.

As the so-called Information Highway is constructed, technological advances will make multimedia and commercial services more affordable and more widely accepted. As a result, the Agency's relationships with its customers—suppliers, customers, other Agencies, and the public—must be based increasingly on electronic communications.

### ***Moving toward Integrated Information***

The migration from the Agency's current functional and local information environment to an integrated information environment will be long and challenging. This process must be coordinated, organized, and built on stakeholder involvement. It will require cooperation to standardize widely used, commonly understood, and persistently needed data and information for Servicewide benefit rather than for individual or functional benefit.

### ***IM as an Implementation Tool***

The principles, strategies, activities, and recommendations outlined in the Framework, this plan, and in numerous other IM efforts should help the Forest Service begin to meet the need for integrated, accurate, and standardized information. The principles are a well-suited guide for the use of the Agency's information resource. The strategies will provide the broad framework for improving the use of that resource. The IMP serves as a clear and concrete road map with specific detailed activities that must be implemented and accomplished for making the vision described in the Framework a reality. Finally, the recommendations from the various IM studies need to be considered, acted upon, communicated, and shared with the field by the responsible officials within the Agency.

## Section 3: Implementation Activities

*“... Information technology, like the new organization, is open and networked. It is modular and dynamic and based on interchangeable parts. It technologically empowers, distributing intelligence and decisionmaking to users. Yet, through standards, it is integrated, moving organizations beyond the system islands of past practices. It works the way people do, ignoring boundaries among data, text, voice and image, and provides a backbone for team-oriented organizational structures. ”*

Don Tapscott,  
*Paradigm Shift, The  
New Promise of  
Information Technology*

### 3.1 Introduction

#### How To Use This Section

This section describes activities the Forest Service must complete to improve the usefulness of its information resources. An activity in this context is an IM task that has a specified start and end date, or an ongoing effort that may or may not have a specific start date. This section is “modular” in that the activities cited can be initiated individually or in groups. It is not necessary that all activities start at once. As would be expected, there are a number of dependencies between various activities. As a result, prioritization and coordination will be critical. All activities described in this section are national in scope and benefit and provide a foundation upon which field IM work can be based.

The activities are divided into the following categories:

#### 3.3 Management Leadership and Support

Addresses management involvement, leadership, commitment, standards, policies, and procedures.

#### 3.4 Skills Development

Covers employee awareness, skills, and training.

#### 3.5 Data Management

Addresses data standards, acquisition, maintenance, and use. This plan considers data as including tabular, spatial attributes, document text, graphics, digital audio, and video data.

#### 3.6 Applications Management

Includes application standards, acquisition, maintenance, and use.

As the Forest Service transitions in the mid-90's, there are significant IM challenges and opportunities ahead. First and foremost is the fundamental recognition by the Agency that information is an important resource like any other resource that we manage. Secondly, continued management leadership and support at all levels of the Agency will be critical to IM success. Thirdly this resource must be adequately funded and professionally managed. Finally, IM must support the principal business objectives of the Agency in a more effective and efficient manner. The price for not achieving some of the stated goals and objectives in IM will erode the Agency's credibility and result in the failure to deliver a basic service needed by both customers and Congress. The benefits will be attained when the Forest Service can "bring quality information in the right format the right time to support sound and deliberate decisions, and to generate ideas."

### 3.7 Technology Management

Covers technology and telecommunications standards, configurations, acquisition, maintenance, and use.

### 3.8 Crosscutting

These activities apply to two or more of the above IM components.

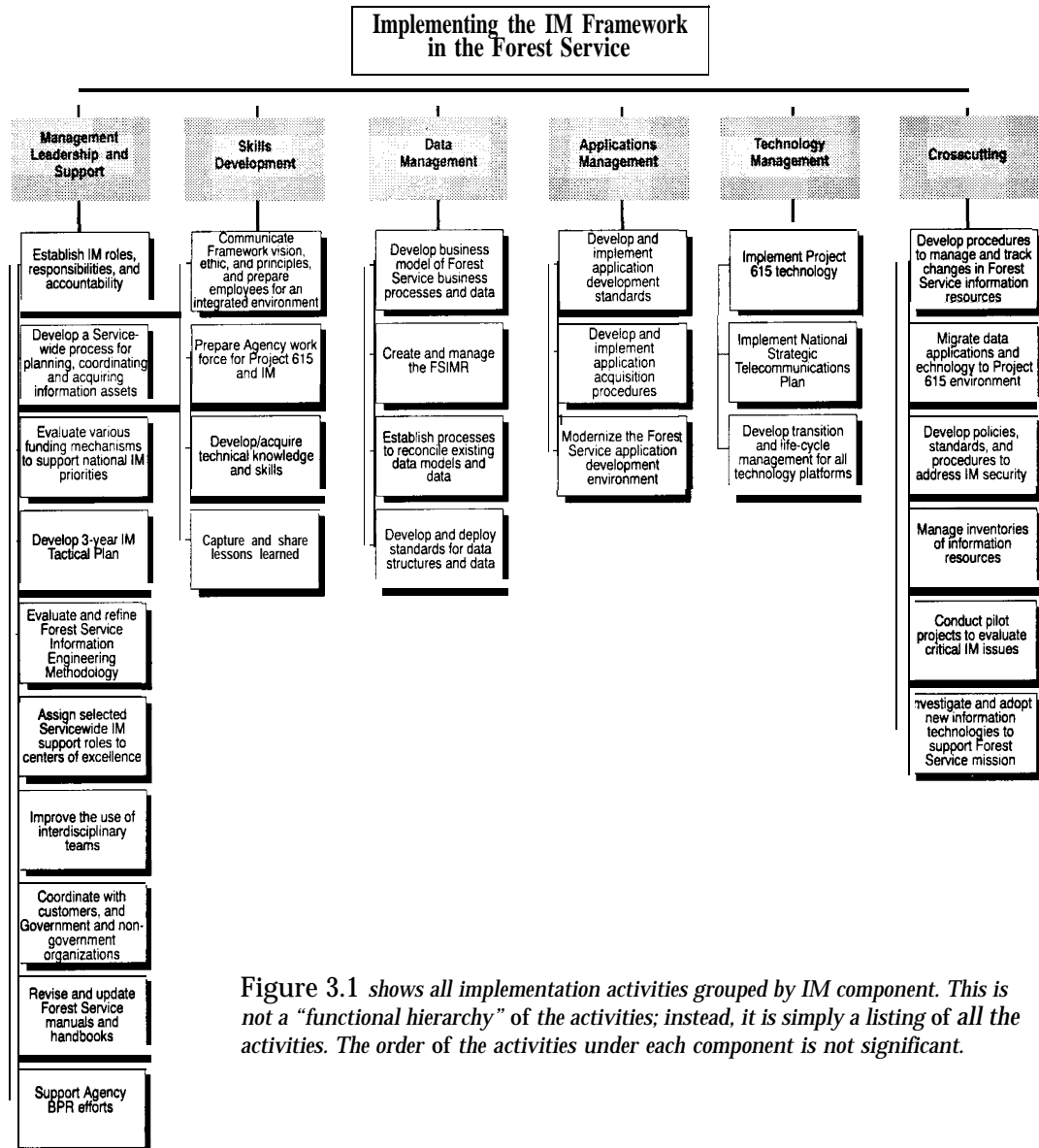


Figure 3.1 shows all implementation activities grouped by IM component. This is not a “functional hierarchy” of the activities; instead, it is simply a listing of all the activities. The order of the activities under each component is not significant.

## **Beyond the Scope of the IMP**

The primary focus of the IMP is on activities that move the Agency toward an integrated information environment. The following are out of the scope of the IMP:

- The day-to-day maintenance and support of data processing is not fully addressed in this plan, though their importance to the Agency is critical. At some sites, most of the resources are devoted to supporting functions such as telecommunications and technology. Downsizing is adding additional impacts to many offices.
- This plan also does not attempt to define how organizations will coordinate functions, nor how information will flow once the integrated information environment is attained. It is expected that the products from several activities (Management 2, Data 4, Crosscutting 1 and 5, etc.) will describe operations within that environment.
- The identification, scoping, and prioritization of specific business applications is beyond the scope of the IMP. Activities that address specific business applications will be accomplished through Phase 2 of the AWSS (see Data 1).
- Staffing requirements and costs also are beyond the scope of the IMP but must be addressed in the 3-Year Tactical Plan (see Section 4 and Figure 3.2 of Section 3).

## **Format of Activities**

In defining the activities, a standard format was used to provide a consistent and usable structure. For each activity, the following information is provided:

- ☐ Component Group, Activity Number, and Short Description
  - IM component (as defined in Section 2) that activity is a part of, its number, and a short title.
- ☐ Activity Statement
  - Detailed discussion of the issue or problem that produces a need for this activity.
- ☐ Desired Results/Products
  - Describes how the activity will be addressed and any resulting products or service.

❑ **Status**

- Identifies the current status of the activity (*Needs Planned, Initiated*) and any supporting discussion.

❑ **Actions**

- General steps that need to be taken to produce the desired results /products.
- The following criteria were used to identify actions for each activity:
  1. An action must lead to the completion of the activity.  
Actions are defined in broad, general terms.
  2. An action must have an identifiable result.
  3. An action does not recommend a specific method for completing the activity, e.g., commissioning a team, unless there are no other alternatives.
- The list of actions for each activity is not comprehensive but serves as a key point for the project manager to consider in completing the activity.

❑ **Priority**

<u>Priority</u>	<u>Timeframe to Initiate</u>
Critical	1 month to 1 year
High	1 to 2 years
Moderate	More than 2 years

The criteria used to assign these priorities are:

1. Is the activity required by an internal or external mandate?
2. Does the activity provide critical support to the integrated information environment?
3. Is there a short-term, high-value payoff to end users?
4. Does the activity support a critical business operation?
5. Does the activity or an event affecting the activity have a fixed date?

## Q Related Activities

This section lists the activities within this plan that must be completed prior to or in conjunction with completion of the activity. A discussion of the relationships between activities is included where appropriate. Figure 3.2 is a graphical representation of the dependencies that exist between the activities.

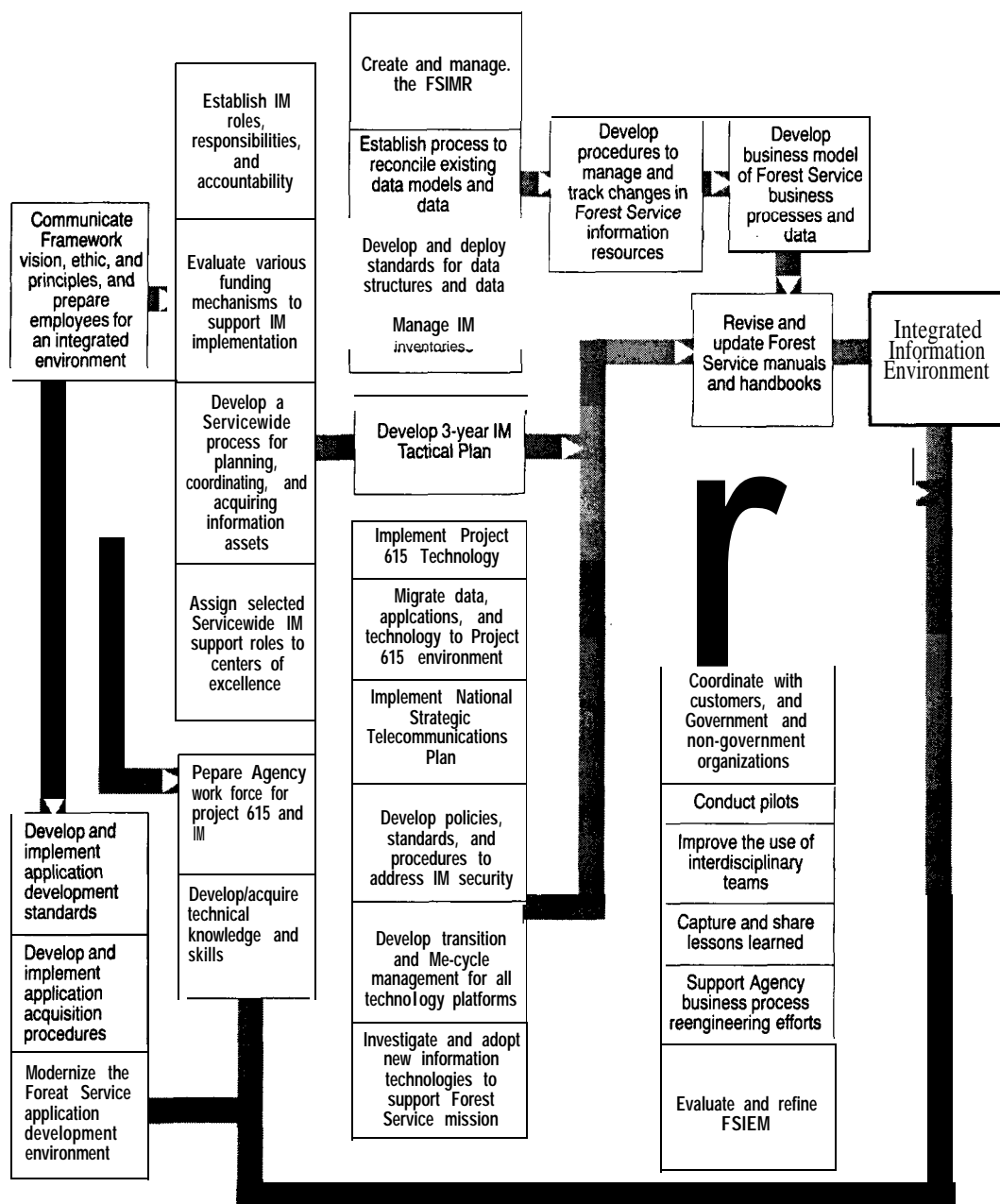


Figure 3.2 Dependencies Between Activities



#### ☐ **Related Documentation**

Lists major documents that relate to the activity (e.g. AWSS, Project 615 Blueprint)

### **3.2 Priority Activities**

The following activities have been identified for FY 1994-95 as having the highest priority. These activities, some of which are underway are seen as requiring immediate attention because they will have the highest payoff to the Agency in the near term. These key activities were selected because they are critical to Forest Service business, benefit the end user, can be delivered in a fairly short time, or are essential in the Agency's IM infrastructure.

1. **Implement Project 615 and associated telecommunications technology** (Technology 1).
2. **Migrate data, applications, and technology to 615 environment** (*Crosscuttirzg 2*).
3. **Establish a Servicewide process for planning, coordinating, and acquiring information assets** (*Management 2*).
4. **Evaluate and adopt appropriate funding mechanisms to support national IM priorities** (*Management 3*).
5. **Develop/acquire technical knowledge and skills** (Skills 1-3).
6. **Develop and deploy standards for data and data structures** (*Data 4*).
7. **Develop procedures to manage and track changes in Forest Service information resources** (*Crosscutting 1*).
8. **Create and manage the FSIMR** (*Data 2*).

### 3.3 Management Leadership and Support Activities

#### Management 1

*Establish IM roles, responsibilities, and accountability.*

##### ☐ Activity Statement

Current IM roles and responsibilities within the Forest Service must be modernized to support work in an integrated information environment. The responsibilities and roles within the Agency must be defined and communicated clearly for maximum operational efficiency.

Establishing and assigning roles is a process by which responsibilities and resources are allocated within an organization. The Agency must define the key roles and leadership needed to support IM, assign responsibility, and establish a set of comprehensive standard criteria for performance against which progress in IM can be measured.

A key role in this new environment is performed by the ad hoc or project team. The role of ad hoc teams in IM should be developed further because they bring interdisciplinary involvement, oversight, and quality assurance to IM projects (see Management 7). IMAG plays a key role in identifying, selecting, and using ad hoc teams. The Framework states that a key function of IMAG is to “provide advice on how to structure interdisciplinary ad hoc teams to carry out needed work.”

In addition, other roles such as CIO, IMAG, steering committees, sponsors, stewards, specialized professional/ technical staffs, business experts, and the end users at all levels of the organization should have responsibilities clearly defined and assigned. Roles such as these will participate in all stages of the IM life cycle.

##### ☐ Desired Results/Products

Forest Service leadership must establish and adopt a set of IM roles, responsibilities, clear performance measures, and accountability standards to support IM in an integrated information environment. The responsibilities of these IM roles should be clearly aligned with the various tasks and products that result from each stage of the FSIEM. Where appropriate, responsibilities should also be tied to the appropriate Framework strategies.

☐ **Status**

Initiated (partially)-CIO and IMAG established, Information Systems and Technology (IS&T) reorganized in February 1994, FSIEM adopted in 1992.

☐ **Actions**

1. Establish broad organizational roles and responsibilities needed for line, staff, and the work force to implement the necessary IM support structure, various memorandums of understanding (MOU's) to support IM, Forest Service Reinvention Team recommendations, field reorganization studies, etc.
2. Working with other agencies, determine and implement operational processes and procedures to incorporate the performance requirements of the GPRA within the FSIEM.
3. Complete the IS&T reorganization and transition effort.
4. Communicate the IM roles and responsibilities of the CIO, IMAG, steering committees, sponsors, stewards, data administrators, project managers, support leaders, etc.

☐ **Priority**

Critical.

☐ **Related Activities**

Management 2,3, and 6; Skills 1.

☐ **Related Documentation**

1. FSM 1390.45 Amendment.
2. IMSS Report.
3. IS&T Concept of Operations (Draft November 4, 1993).
4. IRM Organization Model, William G. Smith.
5. *Oracle Data Processing: A Manager's Handbook*, Graham H. Seibert.

## **Management 2**

***Establish a Servicewide process for planning coordination, and acquisition of information assets.***

### ☐ Activity Statement

Currently the acquisition of shareable, consistent data and integrated applications within the Forest Service is pursued with narrow objectives and in an uncoordinated manner. There are no criteria for determining what data collection (such as resource inventories) should be pursued locally or elevated for possible coordination. Similarly, there are no criteria for determining what applications or other analysis tools should be pursued locally or elevated for possible coordination. It is unclear how national or multiregional Forest Service projects will be evaluated, approved, funded, or assigned resources. This results in redundant effort across the Forest Service, inability to prioritize work, allocation of resources to efforts that may not be critical, confused roles and responsibilities, and a lack of or inadequate support for data management after collection.

A number of planning tools exist or are under development, yet there is no context for their use. These include the IRM Plan, A-n Report, AWSS Report, IMP, 3-Year Tactical Plan, Project 615 Blueprint, Forest Service National Strategic Telecommunications Plan, and other documents.

### ☐ Desired Results/Products

A Servicewide information asset coordination process, similar to the integrated resource inventories, should be developed to:

- Define the roles and responsibilities of the various stakeholders, such as the Chief and Staff, Regional Foresters and Station /Area Directors, CIO, IMAG, District Rangers, project sponsors, and stewards.
- Establish the FSIEM and Forest Service enterprise model as the foundations for planning.
- Provide criteria for determining what application/data management efforts should be pursued locally and what efforts should be elevated for possible coordination.
- Describe various outputs from this process and their use (e.g., IRM Plan, A-n Report, IMP).

- Describe how projects will be approved, prioritized, and funded, and how resources will be allocated.
- Permit monitoring of activities and ongoing feedback to stakeholders.
- Complement rather than hinder Forest Service business activities such as ecosystem management.

☐ **Status**

Initiated.

☐ **Actions**

1. Evaluate current Agency IM processes for planning, coordinating, and acquiring information assets.
2. Define and prototype new Servicewide process for planning, coordinating, and acquiring information assets.
3. Implement the new process.
4. Update appropriate Forest Service manuals and handbooks.

☐ **Priority**

Critical.

☐ **Related Activities**

Management 6; Skill 1.

☐ **Related Documentation**

1. OMB Circular A-130.
2. Fire and Aviation Management Strategic Integrated Plan,
3. Infrastructure Strategic Plan.
4. IMF Report.

☐ **Priority**  
Critical.

☐ **Related Activities**  
Management 1,2, and 6; Skill 1.

☐ **Related Documentation**  
1. Forest Service Report to Congress.

#### **Management 4**

***Develop a 3-year IM operational/tactical plan.***

☐ **Activity Statement**

The Framework states that selection and prioritization of IM projects are keys to success. It describes some aspects of a 3-year planning process involving sponsors, CIO, and IMAG for scheduling and budgeting projects. The AWSS Report also identifies this need and outlines steps to plan these projects. The need for a systematic, coordinated planning process is evident. As part of the larger agency planning process, a 3-year tactical plan that identifies priority projects (including activities described within this document), timeframes, and the resources needed to complete those projects must be developed and maintained.

☐ **Desired Results/Products**

The 3-year plan would show candidate projects at various funding levels. Once funding for the year has been established, selected projects could be initiated. Specific units or centers of excellence are charged with completing assigned IM projects. Information assets of national significance are developed through this process.

☐ **Status**

Needs action.

☐ **Actions**

1. CIO charts an interdisciplinary team to develop a method that combines bottom-up and top-down needs identification of projects that are the most critical to the Forest Service mission in the next 3 years.
2. Resource assignments are made to designated units or centers of excellence to develop, test, or acquire the desired products.
3. Completed products are distributed under established guidelines to customer sites for use.
4. Near the completion of a 3-year planning cycle, additional analysis repeats the identification process.

☐ **Priority**  
Critical.

☐ **Related Activities**  
Management 1,2,3, and 6.

☐ **Related Documentation**  
1. *Information Management: A Framework for the Future.*



☐ **Priority**  
Critical.

☐ **Related Activities**  
Management 1, 2, 3, and 6.

☐ **Related Documentation**  
Framework for the Future: A Framework for the Future.

## Management 5

### *Evaluate and refine FSIEM.*

#### □ Activity Statement

The FSIEM, adopted in February 1992, is a unified system of methods, standards, and techniques that provides structure and support for planning, developing, and operating the Forest Service information system, including the data, process, and technology of that system. The Methodology Consensus Team, which did the staff work that led to the approval the FSIEM, established the basis and components of the methodology. As the Agency's understanding of IM increases, refinements and guidelines will be needed. Specifically:

- The FSIEM and GIS Information Needs Assessment (INA) process should be reconciled. The FSIEM was conceived to support the spatial and non-spatial information needs of Forest Service business, yet some of the unique INA steps are not fully addressed in the FSIEM. Further, pursuing the information needs for GIS separately from those of other areas can result in gaps or overlaps. The Methodology Consensus Report recognized this problem:

With INAs, a decision was made to isolate land-based resource information as the object of analysis. The clear distinction of this data was difficult to make and variously interpreted. This is reflected in the fact that INAs do little to guide the migration of existing resource systems to an environment where the data they store can be tied to GIS features. If the FS integrates INA products into the more inclusive methodology products, linkages of spatial to non-spatial data are defined and migration paths become clearer. With spatial analysis working from a wide base of data, the FS will be able to more quickly capitalize upon the investment in GIS technology

- Minimum standards for using the FSIEM have not been defined. This has resulted in confusion on how and when to use it, and what products should be produced.
- A process to refine and enhance the FSIEM has not been established. Thus, needed changes are not being evaluated or incorporated into the FSIEM.
- The FSIEM provides techniques for describing the data and functions of the Agency. Yet techniques are also

needed for describing the Agency's application portfolio (a combination of all application software used in the Forest Service), business unit locations, business transaction distribution, and technology architecture.

- There is no tie to project management practices and tools.
- Support for change management and version control have not been addressed adequately.

☐ **Desired Results/Products**

The FSIEM should grow with the Agency's changing business requirements. The FSIEM should be documented in the Forest Service manuals and handbooks describing its use, supporting tools, and resulting products. The Forest Service manual and handbook should discuss how modifications will be made to the methodology itself to ensure its continued relevancy. Existing changes / additions to the FSIEM should be evaluated and incorporated as appropriate. The FSIEM and INA processes should be combined so that all data used by the Forest Service are integrated. While project management and change management are distinct efforts that should not be combined entirely with the FSIEM, they are related in many ways. These relationships and dependencies should be defined.

☐ **Status**

Needs action.

☐ **Actions**

1. Reconcile the FSIEM and INA process. Conduct a pilot project to validate this reconciliation.
2. Establish a process to revise the FSIEM as needed.
3. Establish appropriate standards for using the FSIEM.
4. Revise FSIEM as appropriate to include desired enhancements.
5. Document the FSIEM in Forest Service manuals and handbooks.

☐ **Priority**

Moderate.

☐ **Related Activities**

None.

☐ **Related Documentation**

1. GIS Evaluation Report, March 1992.
2. F&AM Information Resource Models, January 1994.
3. Methodology Consensus Report, March 1992.

## **Management 6**

***Assign selected Servicewide IM support roles to centers of excellence.***

### **❑ Activity Statement**

Many IM functions required within the Forest Service include repository management, business model reconciliation, coordination of data standards with other agencies, “help desk,” and coordination of distribution of Agency data to the public. Some of these functions are performed at multiple sites, resulting in high cost to Agency resources. Skill levels must be maintained at multiple units. Extra effort is required to coordinate repetitive activities, and duplicative budgets must be maintained. However, many functions cannot be effective with Regional or local coordination alone. Servicewide coordination of such functions should be managed from a single site for the entire Agency.

Centers of excellence are established, staffed, and funded to perform selected and assigned IM functions as national support to the IM needs of the Forest Service.

Centers of excellence are seen as nationally designated sites detached from the WO but funded by national-level budgets to provide their service throughout the Forest Service. The skill level at the center of excellence in the specific area of service must be maintained above that of other units, though the center of excellence may rely on other sites to assist in the performance of its service.

A center of excellence can be a physical location or dispersed electronically. The staff performing the national support function may be located at a physical site where the required facilities and information are available or distributed between several sites across the Agency. The value of a center of excellence is in reducing overall resources required and allowing dispersed sites to participate in Servicewide responsibilities and budgets (i.e., “economies of scale” ).

Management of the FSIMR is an example where a centrally located service center is required to support the integration of all Agency information assets. The FSIMR is a data base where all models of Forest Service business are kept. It includes the structures and definitions of the data required to conduct that business. Nationally significant descriptions of applications and application modules are kept in the FSIMR. This data base must be populated and kept current to provide the necessary definitions and structures for use by applications developers, and data definitions for use by

all employees. Functioning in a center of excellence environment, developers and users could access the FSIMR for needed information. Developers submit completed definitions and user documentation of new applications and modules to the FSIMR at the center of excellence for reference. The business model, data structures, and definitions are kept current at a single location.

☐ **Desired Results/Products**

The Forest Service will be able to carry out IM functions required of many or all Agency sites in an effective and efficient manner. People at individual sites will not be burdened with skills maintenance, but will be able to devote resources and budgets to increasing productivity. Functions assigned to centers of excellence will be more effectively supported.

☐ **Status**

Needs action.

☐ **Actions**

1. Select specific IM functions as candidates for centers of excellence.
2. Make logical groupings of the functions.
3. Estimate the resources and budgets required to carry out the function or group of functions.
4. IS&T prepares charters for prospective assignments and propose establishment of a center of excellence for each function or group of functions to the Chief and Staff.
5. The site is approved and staffed, and resources and budgets are allocated. For “virtual” centers, the charter is written, the individuals to carry out the function are selected, and resources and budgets are allocated.
6. The center of excellence is initiated, performs for 6 months, and is evaluated for adjustment of assignments.

☐ **Priority**

High.

☐ **Related Activities**

Management 1,2,3, and 7; Skill 1.

☐ **Related Documentation**

None.

## Management 7

### *Improve the use of interdisciplinary teams.*

#### ❑ Activity Statement

The use of interdisciplinary teams is an increasing part of conducting Forest Service business as the need for dynamic coordination increases. Teams can bring a breadth of experience, synergy, and short-term, high-impact results to the project. Teams will continue to be used throughout the Agency to accomplish a variety of IM tasks. Managers and team members must guard against a variety of potential pitfalls in operation and performance of teams.

Some of the potential obstacles to team effectiveness are:

- ***Inadequate definition of project scope and products.*** Abbreviated efforts fail to adequately define the limits or scope of the project and to clearly define the desired product and outcomes. Without clear definitions from project sponsors, the team will expend much of its effort struggling with perceived expectations.
- ***Team member availability.*** Acquiring team members with the necessary skills is very difficult. Managers sometimes are reluctant to commit employees to a team because of other priorities or if salary expenses are not covered. Often, employees are assigned to teams yet retain all of their current responsibilities.
- ***Project planning.*** Team leaders and project sponsors are given little guidance in planning or managing projects, interacting with stakeholders, and delivering products. In the absence of this guidance, each team must develop its own approach to these requirements, which distracts team members from project tasks. Not having a standard approach to project planning and management also confuses stakeholders because of the varied project management approaches by each team.
- ***Adequate support.*** Adequate tools must be available to support team operation. Meeting rooms may be difficult to acquire. Technology such as portable computers, administrative support, and facilitation skills are not always available or can be difficult to schedule.
- ***Steep learning curves.*** Time invested in team building, research, and skills development can be enormous, yet



upon the completion of the project, team learning and synergy is lost or is not passed on to future teams. Reference documents such as task force reports, white papers, and findings from related projects are spread throughout the Agency, making it difficult to locate and use this crucial reference material. Teams can spend up to half of their time gathering and reviewing this information.

• **Travel and per diem costs.** The costs for staffing teams from across the Agency can be very high. Often 80 percent of the project's budget consists of travel and per diem costs.

• **Accountability.** Team members are not always held accountable for delivering the final products. In many cases, most team members do not work to the end of the project, which leaves few team members, if any to see the project to completion.

#### ☐ **Desired Results/Products**

The Forest Service should adopt an approach to using project teams for IM efforts that best takes advantage of a team's unique nature. Guidelines should be developed to help project managers plan, staff, and manage teams. Project sponsors should be held accountable for clearly defining the project scope and products. Teams should be recognized as short-term, high-impact, narrow-focus work groups that are given adequate resources and authority to complete their task. Where practical, teams should be given tools to maximize their productivity, such as portable PC's, project rooms, and an automated reference library (reports, white papers, articles). Team members should be used over several projects so that both they and the Agency benefit from the team's skills. Innovative ways should be explored to help minimize the impact of frequent travel on team members and to reduce travel costs. Expertise and lessons learned should be passed on to subsequent teams. Managers should recognize the commitment that team participation requires and allow their employees to participate on the team to the extent they are needed. Team members should be committed to the team until the final products are delivered. Team building, opportunities to participate on teams, and project management training should also be provided. To encourage team participation, team members should be duly recognized for their participation.

#### ☐ **Status**

Planned.

☐ **Actions**

1. Establish standards for managing projects.
2. Explore ways to better use teams in IM. Develop guidelines on the use, participation in, and management of teams.
3. Provide necessary training for team members, project managers, and project sponsors.

☐ **Priority**

High.

☐ **Related Activities**

None.

☐ **Related Documentation**

1. FS Accountability Task Force Report, 1993.
2. *Paradigm Shift*, Don Tapscott.
3. *The One-Minute Manager Builds High Performance Teams*, Kenneth Blanchard; Morrow, 1990.
4. *Practical Project Management*, Meilir Page-Jones; Dorset House, 1985.
5. *Managing Projects in Organizations*, J. Davidson Frame; Jossey-Bass, 1991.

## **Management 8**

### ***Coordinate with customers, and Government and non-government organizations.***

#### ☐ **Activity Statement**

Current and future activities of the Forest Service will create a greater need to work with and provide integrated information to other organizations, Agencies, and the public. As ecosystem management, which crosses functional and administrative boundaries, is carried out, and as the need for the public to access Forest Service information increases, the challenge for the Agency will be to develop necessary structures to facilitate this sharing while maintaining the integrity and security of its information assets.

Information will be shared more extensively outside the Forest Service with such entities such as Congress; GAO; Data Administration Management Association (DAMA); Federal Geographic Data Committee (FGDC); Interagency Resource Information Coordinating Council (IRICC) in Region 5 and 6 (this includes Fish and Wildlife Service (FWS), National Park Service (NPS), Bureau of Land Management (BLM), Bureau of Indian Affairs (BIA), and Environmental Protection Agency (EPA); USDA Office of Information Resources Management (OIRM); universities and research foundations; state, local, and international agencies; private corporations; public interest groups; and the general public.

#### ☐ **Desired Results/Products**

The Forest Service must work closely with outside Agencies and professional organizations in areas of common interest in order to share expertise and services. Making information available is a two-way exchange that has potential benefits for increasing the capability of the Agency as it communicates and shares its information resource with outside organizations. Recognizing that information, like any other resource, needs to be managed is a key factor of the Agency's IM maturity. Providing accurate, consistent, and timely information within and outside the Agency will require diligent coordination and cooperation from all employees.

#### ☐ **Status**

Initiated at various levels within the Agency, but there is no coordinated national effort.

☐ **Actions**

1. Develop comprehensive plan for Agency cooperation with external partners.
2. Coordinate with other Agencies on standardizing information for sharing and use of external information within the Agency
3. Publish national and local sources of information available to external customers.

☐ **Priority**

High.

☐ **Related Activities**

None.

☐ **Related Documentation**

None.

## **Management 9**

*Revise and update Forest Service manuals and handbooks.*

### ☐ **Activity Statement**

The current structure of Forest Service Manual (FSM) sections on Information Management (FSM 1390), Computer Technology Management (FSM 6610), Computer Software Management (FSM 6620); and Forest Service Handbooks (FSH) entitled Electronic Office Handbook (FSH 1309.15), Application Developer's Handbook (FSH 6609.13), and Standards for Data and Data Structures Handbook (FSH 6609.15) does not fully recognize the FSIEM as the cornerstone for IM nor does it treat data standards as the foundation for implementing automated business practices.

The contents of the current FSM 1390 and 6600 sections have evolved within the constraints of the directive structure. Upon streamlining the directives structure, it will be necessary to continue revising the FSM'S and FSH'S as the Agency's information policies mature.

### ☐ **Desired Results/Products**

Reorganize and rename the FSM 1390 and 6600 sections of the directives and rewrite the contents to provide policy and direction that are in line with the Agency's approach to managing information.

In the FSM, the FSIEM and data standards should be primary tools supporting IM. The subjects of computer software and computer technology are subordinate to or follow good business models and data standards. The FSM should be restructured to make that emphasis more apparent.

### ☐ **Status**

Planned.

### ☐ **Actions**

1. A team of IM professionals with expertise in Forest Service directives reviews current FSM and FSH organization and recommends structural changes to better support IM.
2. CIO reviews the recommendations and determines structural changes.

3. The current FSM and FSH are incorporated into new directory structure.
4. Continue the lifecycle management of FSM and FSH contents to reflect ongoing changes to IM in the Agency.

☐ **Priority**  
Critical.

☐ **Related Activities**  
All activities.

☐ **Related Documentation**

1. FSM 1100, Directives System Manual.
2. FSH 1109.12, Directive Preparation Handbook.

## **Management 10**

### ***Support Agency business process reengineering efforts.***

#### ☐ **Activity Statement**

Business process reengineering (BPR) and business process improvement (BPI) are approaches for redesigning work processes that are gaining practitioners and advocates throughout industry and Government. They are frequently aligned with an organization's programs of quality improvement, IM, and technology deployment. Because IM and information technology (IT) are important enablers of work processes, their resources and representatives are key contributors to BPR efforts. There are similarities between the structured approaches used by BPR/BPI and information engineering (IE) to analyze and document business and information system requirements. The relationships between BPR/BPI and IE need to be better understood and linkages need to be established.

#### ☐ **Desired Results/Products**

The Forest Service must learn more about BPR and BPI—their uses, costs, benefits, risks, methods, and relationship to similar approaches used in quality management and IE. The Forest Service should understand organizational readiness issues and assess its own readiness for making use of this improvement approach. The Agency should incorporate BPR and BPI into its approaches for improvement, apply them appropriately, and link them effectively to its approaches to IM and IT deployment. The Forest Service must apply IM and IT to improve its work processes. BPR and BPI efforts will be successful only if they have been well-planned and executed

#### ☐ **Status**

A subteam of the Forest Service Reinvention Team is exploring BPR and its applicability to the reinvention effort. The team may make recommendations on the usefulness of BPR.

#### ☐ **Actions**

1. Learn more about BPR and BPI, their uses, costs, benefits, risks, methods, and relation to programs of quality management, IM, and technology deployment. Consider the experiences of Federal Agencies (such as the Internal Revenue Service (IRS) and Department of Defense (DoD)) that have been engaged in BPR efforts for some time.
2. Develop measures of organizational readiness and assess the Forest Service.

3. Consider a pilot test of BPR/BPI techniques to assess their usefulness, requirements, and links to quality management, IM, and IT.
4. Provide guidance on applying BPR/BPI to the application of IM, IE, and IT.

☐ **Priority**  
Moderate.

☐ **Related Activities**  
None.

☐ **Related Documentation**

1. *Paradigm Shift* The New Promise of Information Technology, Don Tapscott and Art Caston.
2. Regina Kidd, unpublished notes on BPR for the Re-engineering Work subteam of the Forest Service Reinvention Team, March 1994.
3. Proceedings of the Sixth Annual DAMA Symposium, *Business Reengineering: The Competitive Edge*. May 11-12, 1993.



### 3.4 Skills Development Activities

#### Skill 1

***Communicate Framework vision, ethic, and principles and prepare employees for an integrated information environment.***

#### ☐ Activity Statement

The Forest Service must take necessary steps to ensure that employees understand, accept, and support IM vision, ethic, and principles at all levels. The difficult cultural and behavioral changes required of all employees and the understanding that we need to be stewards rather than owners of information are relatively recent developments. Employees will need new skills in an integrated information environment in order to meet customer needs within and outside the Agency.

#### ☐ Desired Results/Products

Develop a national communication and training plan for the Forest Service.

As identified in Strategy 7 of the Framework Information and Training Plans, the CIO will take lead responsibility for communication to all Forest Service employees current efforts to implement the Framework. By reactivating the national "Preparing People" effort, communicating accomplishments in the AWSS Report, the IM13 and other national efforts, the CIO and the selected teams will provide further understanding and clarification of Agency goals and direction in IM.

To address the challenging cultural issues associated with IM, Regions and Stations already are providing training for employees that will expand their management skills and behavior to meet changing work environments. This effort clearly must answer the question "What's in it for me?" for each employee, as well as "What's in it for the organization?" It must show the benefits of moving toward a shared IM environment as a result of minimizing the duplication of data. The national training and communications plan must contain provisions for ongoing training efforts and document the successful completion of implementation activities Servicewide to encourage participation in the transition.

Skills Development Activities 1–3 are closely related and should be pursued collectively. A single national training plan should be developed to address these skills development activities. All references to a national training plan in Section 3.4 are in reference to the National Training Plan called for in Strategy 7 of the Framework.

☐ **Status**

Initiated. Several efforts have been undertaken since the approval of the Framework in 1992 to address the communication and awareness needs, such as the “Preparing People” team, IMEC, “Adventures in IM and GIS” video produced in Region 6, and numerous others throughout the Agency. A national team was commissioned in May 1994 to develop the national training plan.

☐ **Actions**

1. Identify a national training coordinator to help facilitate training/ skills development initiatives in the Agency.
2. Reactivate the “Preparing People” team to serve as the umbrella group for all national skills development and training projects. Clearly define the team’s scope and objectives.
3. Develop and implement a Framework communication plan for all levels of the Forest Service. The plan should recognize the varying needs of different audiences.
4. As part of a national IM training/development plan (see Skill 3), develop a training curriculum that focuses on cultural change brought about by changes in IM. Suggested topics include adaptive management, self-directed team participation, change management, total quality management, and assertiveness training.
5. Develop measures of progress over time as part of the inventory baselines established and tracked in Crosscutting 2, from the current situation to the stage at which the Agency work force is using standardized application software, data bases, and tools to accomplish the work that previously was accomplished in numerous environments and with a variety of applications.

☐ **Priority**

Critical.

☐ **Related Activities**

Skills 2 and 3.

☐ **Related Documentation**

1. Preparing People Communications Plan (draft).
2. Education Guide for IM Skill Path Development Brochure (IMEC).

## **Skill 2**

### ***Prepare Agency work force for Project 615 and IM.***

#### ☐ Activity Statement

Project 615 represents the next generation of corporate technology and applications for Forest Service end users. Estimated investment for Project 615 is approximately \$1.2 billion over the next 5 years (hardware and software procurement, and operations costs). The Forest Service must maximize the return on this investment as early as possible by developing and implementing an effective national training effort. The work force must possess the technical skills within user-defined roles to fully utilize standardized application software and technology to meet critical business objectives. This should be accomplished at all locations with minimal retraining during career progression.

#### ☐ Desired Results/Products

Develop and implement a training and education plan for Project 615 and IM for end users. Identify what minimum training is needed, who needs it, and how and when it will be delivered over the next several years. Maintain and track training, skills, and roles of the end users.

The "Preparing People" team initiated this activity in November 1992. To maximize efficiency the CIO must complete this effort to train the work force before equipment arrives at the units. The IMEC has begun work on this effort but is supported only by the involved Regions and Stations. National focus, support, and involvement is needed if consistent and standardized levels of training are to be made available to all employees. This plan must be completed soon after the 615 contract is awarded and alternatives are developed to best deliver training to end users.

#### ☐ Status

Initiated.

☐ **Actions**

1. CIO appoints a national training and development coordinator.
2. National training coordinator develops a national training plan in cooperation with the “Preparing People” team, IMEC, and the 615 vendor.
3. Maintain and track training record of courses offered, attendees, and costs.

☐ **Priority**

Critical.

☐ **Related Activities**

Skills 1 and 3.

☐ **Related Documentation**

1. Project 615 vendor training plans.

### **Skill 3**

#### ***Develop/acquire technical knowledge and skills.***

##### ☐ **Activity Statement**

Currently there is a wide disparity in training efforts, gaps in coverage of specialized needed courseware, and limited training opportunities. Training and travel are being cut as budgets are being reduced. The Forest Service must find alternative ways to acquire the quality and quantity of training needed by the workforce to exploit the Project 615 technology and adopt the methods and skills practiced in the computer industry.

Skills needed include expertise in the following areas:

- FSIEM;
- 、 project management;
- system life-cycle management;
- 、 BPR;
- quality assurance and software metrics;
- 、 data base administration (DBA);
- CASE tools and repository management;
- 、 wide, metropolitan, and local area networks;
- client /server architectures;
- 、 use of GIS;
- data base management systems;
- 、 analytical programming tools and languages; and
- 、 emerging multimedia and document management technologies.

##### ☐ **Desired Results/Products**

Prepare and implement a national training and development plan for technical specialists and a road map for career development. Adopt skills matrix developed by IMEC and tie this with the roles and skills needed to serve the Forest Service customer base. This

plan should identify innovative and cost-effective ways to develop these skills. Apprenticeship, mentoring participation in professional organization, on-the-job cross-training, and interagency sharing of scarce personnel should be included in addition to formal training. The plan should provide guidance to managers on using consultants and professional services and include a range of alternative services available to help accomplish the Forest Service mission.

☐ **Status**

Initiated.

☐ **Actions**

1. Define roles and skills needed to support IM Framework objectives.
2. Develop national training plan for technical specialists in conjunction with efforts needed for end user and manager training defined in Skills 1 and 2.
3. Assess the current Forest Service skills base.
4. Develop and display alternative methods of acquiring training and /or hiring people with the skills needed to accomplish a given project.
5. Maintain as part of Crosscutting Activity 4.

☐ **Priority**

Critical.

☐ **Related Activities**

Skills 1 and 2; Crosscutting 4.

☐ **Related Documentation**

1. Preparing People Communications Plan (draft).
2. IMEC Training Curriculum.

#### **Skill 4**

##### ***Capture and share lessons learned.***

#### ☐ **Activity Statement**

The Agency needs to capture and share lessons learned by individuals and teams with regard to GIS, various IM projects, technology learning labs, decision support systems, expert systems, object-oriented programming, software application techniques, project management, quality assurance, and software metrics. Even information gained from projects that have failed is and needs to be shared.

The environment necessary for such a learning environment must be fostered where technical experts and users may freely express and contribute their knowledge and expertise. Peer review, dialogue via electronic mail and tele / video-conferencing, published newsletters, Agency publications, and opportunities to interact formally and informally at conferences and professional meetings are all means to encourage the advancement of individuals in their particular fields. Coordination is needed to provide opportunities for various specialists to meet and disseminate valuable knowledge, experience, and recommendations that they have to share. The Forest Service encourage the cross-fertilization of expertise among all units to minimize the amount of relearning that is necessary.

#### ☐ **Desired Results/Products**

Develop a systematic and coordinated means by which users and technical specialists can share their learning and experience. Despite the powerful communication tools available to many employees, few people know what 615 technology is, how CASE is being used, or the current developments in research in the area of decision support systems. The Agency should recognize the informal systems at work and participate actively, both formally and informally, to disseminate lessons learned.

#### ☐ **Status**

Needs action.

#### ☐ **Actions**

1. Provide a central repository of the most commonly asked questions and answers.
2. Review all formal team reports and extract lessons learned and recommendations.



3. Provide local and national opportunities for dialogue and exchange, and share with outside audiences.
4. Publish a newsletter that consolidates IM efforts.
5. Provide peer review for difficult projects.
6. Update the FSM and FSH with policies and guidelines that reflect the best professional practices and knowledge within the Forest Service.
7. Use the best technology available to make publications widely available.
8. Explore multimedia technology as a means of disseminating information.

☐ **Priority**  
High.

☐ **Related Activities**  
Management 7; Crosscutting 5.

☐ **Related Documentation**  
None.

### 3.5 Data Management Activities

#### **Data 1**

***Develop enterprise model of Forest Service business processes and data.***

#### ☐ **Activity Statement**

Forest Service information currently is managed in a highly functional and inefficient manner. There is no comprehensive model of the Agency's information assets. This results in misconceptions about the Agency's business, a lack of understanding of the Forest Service information resource, redundant IM efforts, and barriers to coordination. Information is not easily shared between Forest Service organizations or with external groups. An enterprise model is a high-level, conceptual model that describes the Agency's information requirements and business processes. To gain an understanding of Forest Services business processes and information and better use its information resources, an integrated, comprehensive business model must be developed.

#### ☐ **Desired Results/Products**

The AWSS, commissioned in July 1993, began to address this critical issue. A project in two phases, its purpose is to develop a high-level model of the Agency's business processes and information. Completion of Phase 1 will result in an enterprise model. Phase 2 will deliver a more detailed model that defines the Agency's information in logical business areas known as focus areas. In this phase, priorities will be set for addressing Forest Service information needs and a course of action will be laid out for accomplishing these priorities. With the completion and adoption of the AWSS deliverables, the Forest Service will have a tool that will help management better understand the Agency's information needs. The enterprise model will be a tool for the Agency to plan, prioritize, and coordinate IM projects of both a spatial and non-spatial nature.

It is important to note that specific business application projects will be defined, scoped, and prioritized as a result of Phase 2 of the AWSS. The IMP does not directly identify specific business applications or data collection efforts.

☐ **Status**

Phase 1—Initiated; Phase 2—Needs action.

☐ **Actions**

1. Approve and make available to the Agency the products of Phase 1 of the AWSS.
2. Initiate Phase 2 of the AWSS using both top-down (AWSS), bottom-up (DPD Project), and mid-level (Range Management Information Project, Integrated Resource Inventory) project contributions.
3. Provide guidance on the construction and use of the enterprise model.
4. Provide periodic status reports on AWSS-related activities.
5. Reconcile existing and planned IM projects with the enterprise model.
6. Provide necessary support structures such as the FSIMR and data standards to facilitate use and maintenance of the enterprise model.
7. Establish a national data administrator position.

☐ **Priority**

Critical.

☐ **Related Activities**

Data Management 2,3, and 4; Skill 1; Crosscutting 1 and 4.

☐ **Related Documentation**

1. Forest Service AWSS Report, December 29,1993.

## **Data 2**

### ***Create and manage the FSIMR***

#### ☐ **Activity Statement**

An IM repository supporting procedures, and staffing are needed throughout the Agency to help develop, coordinate, and use information about our information assets. The FSIMR contains descriptions of those assets, how they are related to each other, and how they support the Agency's mission. The Agency currently uses the Forest Service Atlas-based on Oracle's CASE\*Dictionary as a repository to document business processes, data, and applications. This software is available throughout the Agency, but because of technology constraints, lack of coordination at all levels, narrow scope, and insufficient standards, the information in the Forest Service Atlas is not always maintained, is difficult to use, and does not promote Servicewide coordination. Without a well-supported IM repository, coordination in a decentralized environment will be difficult if not impossible. A well-supported and easily accessible data repository is critical in achieving an integrated information environment.

The FSIMR team was commissioned in 1992 to examine repository issues. They produced a report with alternatives, recommendations, and work plans.

#### ☐ **Desired Results/Products**

To address the problems cited, the Forest Service must provide a data repository to users that is easy to use and well-supported nationally and locally. It must support all phases of the FSIEM. It should support IM planning, application development, change management, and model reconciliation. It should enable users to coordinate and share work, thereby reducing redundancies and costs. The FSIMR must be staffed and managed aggressively to provide quality products and services to users. As a clearinghouse, the FSIMR should be the source for information asset definitions, contact points, work status, and related documentation.

#### ☐ **Status**

Planned.

### **Data 3**

#### ***Establish processes to reconcile existing data models and data.***

##### ☐ **Activity Statement**

Conflicting business models, data structures, and data must be reconciled at all levels of the Agency so that they reflect one integrated environment. This process is very difficult to accomplish as limited time is committed to resolution between discrete functions or projects. Also, because of the lack of an enterprise model in the FSIMR as a common reference, it is difficult to reconcile conflicts between projects. This results in incremental, parochial, and costly changes. The proper procedures are not in place and adequate staff is not available to support reconciliation. The enterprise model is not a “silver bullet,” but redundancy will exist and integration of Forest Service information will be impossible without it.

##### ☐ **Desired Results/Products**

A reconciliation process should be established throughout the Agency that facilitates the resolution of differences in business models, data structures, and data. Current owners of systems must become stewards of their portion of the model. Both business and technical people must be trained to participate in the process of bringing about consistent Forest Service processes. The enterprise model must be in place to provide the context for this reconciliation. Standards also must exist so that Forest Service information assets are defined and understood by all stakeholders.

The reconciliation process should be considered as part of a the broader change management process discussed in Crosscutting 1. It is highlighted here as a separate effort because of its critical nature and level of complexity.

##### ☐ **Status**

Planned

A limited number of national and mid-level projects are underway, but there is no Servicewide effort.

##### ☐ **Actions**

1. Establish a process to reconcile models, data structures, and data.

2. Establish a center of excellence to provide leadership and support for model reconciliation.
3. Initiate efforts to reconcile existing work with the emerging AWSS enterprise model. Reconciliation is an ongoing effort that is a logical result of integrating work in a decentralized environment.
4. Update FSM and FSH.

☐ **Priority**  
Critical.

☐ **Related Activities**  
Data Management 2, and 4; Crosscutting 1 and 4; Skill 1.

☐ **Related Documentation**  
Refer to documentation on other applications in the Forest Service Atlas as appropriate.

#### **Data 4**

##### ***Develop and deploy standards for data structures and data.***

☐ **Activity Statement**

There are no comprehensive national standards for describing, defining, and using spatial and non-spatial data in the Forest Service. Because of the absence of data standards, sharing of data is difficult and inefficient. This lack of standards causes individual projects or groups to create their own definitions and relationships that may or may not agree with other functional standards that have been defined. The complexity and importance of this activity increases when the requirements for sharing information with external organizations are considered.

☐ **Desired Results/Products**

Data standards result in data that is shared, of high quality, consistent, integrated, secure, and synchronized. Standards for defining, describing, and using data should be established, such as data structure naming standards, defining standard GIS layers, and defining standards for vertical integration of spatial data.

☐ **Status**

Needs action. Functional and local efforts have produced various standards but there is no coordinated national effort.

☐ **Actions**

1. Evaluate existing spatial and non-spatial data standards within and outside the Agency.
2. Develop Servicewide standards.
3. Update FSM and FSH.

☐ **Priority**

Critical.

☐ **Related Activities**

Data 1,2, and 3; Crosscutting 1; and, Skill 1.

**❑ Related Documentation**

1. NIST Special Publication 500-208, Manual for Data Administration.
2. FGDC Metadata Standards, Executive Order, April 1994.



### 3.6 Applications Management Activities

#### Application 1

***Develop and implement application development standards to support life-cycle management.***

##### ☐ Activity Statement

In many instances, Forest Service application development standards are outdated and inadequate. The result is high development and maintenance costs, inconsistent user interfaces, and complex procedures. Standards are lacking in the use of the Forest Service methodology standard user interfaces, security solutions, software design and approval, client-server/ distributed data base issues, and documentation. Often the focus is on delivering the product rather than considering the requirements of the application over its life cycle. This leads to products that are not fully supported or maintained.

##### ☐ Desired Results/Products

Modernizing and instituting application development standards in the Forest Service should result in software that:

- requires little end user training,
- is engineered,
- is modular and reusable,
- uses a consistent user interface,
- is easily supported and maintained, and
- provides a high return on investment because standardized components are used.

Applications are a logical result of using the FSIEM, so it must serve as the basis for all development standards. Standards should be developed to address:

- use of the methodology in developing applications;
- building applications in a modular and reusable fashion;

- providing common user interfaces;
- documentation standards;
- software approval process that is tightly integrated with the various phases of the methodology;
- standard software installation procedures;
- client-server/ distributed data base issues;
- security issues; and
- use of development tools such as CASE tools, code generators, and third and fourth generation programming languages,

Standards should guide the Agency in evaluating externally developed applications to determine if they will function in and add value to the Forest Service integrated information environment.

#### ☐ **Status**

Initiated.

A considerable amount of work has already been started to address the standards issue. The Forest Service Application Environment Project (FSAE), 615 Open Systems Environment Projects, and the IAP have begun to address the issues of common user interfaces and security.

#### ☐ **Actions**

1. Evaluate existing application development standards for relevancy and potential revisions.
2. Reconcile all existing application development standards projects to determine what is and is not being covered.
3. Evaluate standards developed by external organizations for possible use.
4. Develop application guidelines and standards,
5. Update the appropriate FSM'S and FSH'S,

☐ **Priority**  
High.

☐ **Related Activities**  
Data 2; Applications 2 and 3; Skill 1.

☐ **Related Documentation**

1. *Forest Service Applications Environment Developers Guide.*
2. *Open Systems Environment Preparing Technology Report and Style Guide.*
3. *integrated Applications Project Report.*
4. *Forest Service Application Toolbox User's Guide.*
5. *Application Developer's Handbook, FSH 6609.13.*

## **Application 2**

### ***Develop and implement application acquisition procedures.***

#### **❑ Activity Statement**

Currently there is no rigorous approach to assist Forest Service management in determining how the need for business applications will be met. Applications are often developed in-house or acquired from outside sources without examining the costs and benefits of various options. This results in high development costs, inadequate business solutions, and applications that do not support the Forest Service integrated information environment.

#### **❑ Desired Results/Products**

Applications needed to support business requirements can be acquired by developing the software in-house, obtaining existing software from external organizations at little or no cost, or purchasing software from commercial sources. There are advantages and disadvantages to each approach but all factors must be considered. Applications developed in-house offer the most flexibility and customization but at a high cost. Applications from other Agencies cost little but may be customized and require expensive modifications. Commercial software is available in a variety of forms but may be difficult or impossible to customize to meet Forest Service business requirements. Criteria must be established to guide the Agency decisionmakers in selecting the best source to meet application requirements. Considerations in choosing the appropriate source are:

- cost of acquisition,
- time required to implement,
- adherence to Forest Service standards, and
- degree of compatibility with Forest Service integrated information environment. This is determined by evaluating the alternative against the Agency's data, process, and technology models (enterprise model).

These criteria should be considered when obtaining contractor support to develop business applications. Where appropriate, contracting provisions should be established to support these requirements. Making the decision to acquire software is not an isolated effort, but one aspect of providing IM solutions to meet business needs through the use of the FSIEM.

☐ **Status**

Needs action.

☐ **Actions**

1. Define criteria and procedures for evaluating alternatives for application acquisitions,
2. Revise the FSIEM to include software acquisition criteria.
3. Update the appropriate FSMS and FSHS.

☐ **Priority**

Moderate.

☐ **Related Activities**

Applications 1 and 3; Skill 1.

☐ **Related Documentation**

1. *Methodology Consensus Report.*

### **Application 3**

#### ***Modernize the Forest Service application development environment.***

##### ☐ **Activity Statement**

Application development practices, tools, and skills in the Forest Service must be modernized to improve the productivity of application developers. This will help them provide high-quality, cost-effective applications to meet the Agency's business needs. The production of applications currently is carried out more as a craft rather than as a highly disciplined, engineered approach. The tools available to support development are limited in that they do not support code generation, configuration management, change management, and quality assurance (testing). Also, these tools are much more labor-intensive than is necessary, given the current state of software development technology.

##### ☐ **Desired Results/Products**

The Forest Service should establish an application development environment in which the production of software is automated to the fullest extent possible. This would be accomplished by building an environment that is tightly linked with the FSIMR and supported by code generators, configuration management tools, and other application development productivity software. Change management tools and practices should be established to better respond to business needs. Software testing tools and centers are needed to ensure that quality products are delivered to customers.

While the aim is to automate those development tasks that are routine, there still will be a need for flexibility and craftsmanship in application design and production. The Forest Service will continue to seek innovative approaches to ecosystem management, research, and other areas which will require state-of-the-art applications.

##### ☐ **Status**

Needs action.

☐ **Actions**

1. Evaluate development function in the Forest Service to determine application development support requirements.
2. Evaluate and acquire tools to support application development.
3. Develop appropriate policies and procedures.
4. Update the appropriate FSM'S and FSH'S.

☐ **Priority**

Medium.

☐ **Related Activities**

Applications 1 and 2; Skill 3.

☐ **Related Documentation**

None.

### 3.7 Technology Management Activities

#### Technology 1

##### ***Implement Project 615 technology.***

#### ☐ **Activity Statement**

The Forest Service is in the process of acquiring a major technology procurement to replace current DG systems initially implemented in 1983. The new technology must meet current and future business information requirements for the next 5 to 8 years. In addition to major hardware components and peripherals, the major software components will include GIS, data base management systems, analysis tools, programming languages, and office automation. Additional procurements, such as imaging and remote sensing, CAD, statistical packages, and support services contracts, will be covered under the Project 615 umbrella.

When the Project 615 Strategy (Blueprint) document was published in April 1992, preparation for implementation of Project 615 had been underway for several years. The new hardware platform and software tools acquired under Project 615 will allow for the storage, retrieval, analysis, and presentation of information on land-based resources, management direction, and activities. Project 615 will gradually replace the work currently supported by the DG. The procurement of Project 615 is intended to meet current and ongoing technology requirements driven by ecosystem management and customer expectations.

#### ☐ **Desired Results/Products**

Award, acquire, implement, and monitor 615 technology throughout the Agency. All implementation activities and deliverables are discussed at length in the 615 Blueprint document and in Regional/Station implementation plans. The 615 Blueprint strategy includes five major phases and associated activities to successfully meet critical organizational objectives, and congressional and GAO concerns. The phases are:

1. Management and oversight of the funding and procurement process.
2. Information preparation for data standards, structures, acquisition, and conversion.
3. Preparing employees for the change to the new 615 environment.



4. Preparing technology for issues related to hardware, software, and communications networks.
5. Pilot lessons for first-year installations and lessons learned.

To address 615 integration, the following national teams were formed under the 615 Blueprint Steering Committee and a contractor, Kajax Engineering Inc. (KEI), was enlisted to address congressional and GAO concerns:

1. "Preparing People" Steering Group.
2. Information and Data Migration Steering Group.
3. Open Systems Environment Steering Group.
4. Applications Functionality Steering Group.
5. Pilot year evaluation and monitoring by KEI and 27 pairs of selected sites.

Many of the Project 615 activities underway have been incorporated as much as possible into this implementation plan to minimize duplication of effort and avoid misallocation of limited resources.

☐ **Status**

Initiated in April 1992.

☐ **Actions**

1. Award contract and implement 615 technology.
2. Conduct pilot study for the first year of award at 27 pairs of selected sites (see Crosscutting 5).
3. Develop WO 615 implementation plan.
4. Accomplish full implementation of 615 technology over 5 years to meet ongoing integrated business-driven and data-driven requirements after the beginning of the second year.

See the Blueprint document for a complete discussion of these steps.

☐ **Priority**  
Critical.

☐ **Related Activities**  
Skills 2 and 3; Technology 2; Crosscutting 2 and 3

☐ **Related Documentation**  
1. *Program 615 Strategy (Blueprint)*, April 1992.  
  
2, *A Road Map of Forest Service Application Systems and Projects*,  
July 18, 1993.  
  
3. *A-11 Report for FY 95-99*, Washington, DC, 1993.  
  
4. *Information Resource Management Plan FY 94-98*. (Draft 1994)

## Technology 2

### ***Implement National Strategic Communications Plan in support of Forest Service IM needs.***

#### ☐ **Activity Statement**

Telecommunications are an integral part of the information systems infrastructure of the Forest Service. The transition of the Forest Service distributed processing system from a proprietary system to an open systems environment, along with the rapid changes taking place in the telecommunications industry provide many opportunities and challenges to effective use of telecommunications to help achieve management needs.

#### ☐ **Desired Results/Products**

The Forest Service information system infrastructure needs to continue to evolve as open systems technology is implemented. This infrastructure, including its telecommunications components, need to effectively support the IM needs of the Forest Service.

#### ☐ **Status**

Initiated. In March 1994, the Forest Service completed a National Strategic Telecommunications Plan. This plan was completed in a joint effort with the Institute for Telecommunication Sciences, National Telecommunications and Information Administration, U.S. Department of Commerce.

#### ☐ **Actions**

1. Begin implementation of the National Strategic Telecommunications Plan in support of Project 615 implementation and other IM activities.

#### ☐ **Priority**

Critical.

#### ☐ **Related Activities**

Technology 1.

#### ☐ **Related Documentation**

1. National Strategic Telecommunications Plan, 1994.

### **Technology 3**

#### ***Develop transition and lifecycle management for all technology platforms.***

##### ☐ **Activity Statement**

It is essential to maintain current operations of existing DG equipment and software, Unix workstations, PC's (desktops and portables), field computers, and other hardware, software, peripherals, and support services as Project 615 is phased in. For example, in the current Forest Service IRM Plan for FY 94-98 an estimated \$480,358,000 has been projected to continue the maintenance and staff costs of the DG equipment and software. The actual figures may vary depending on how fast the Agency migrates to the new 615 platform.

##### ☐ **Desired Results/Products**

Establish lifecycle management guidelines and provide a clearinghouse service for the use and disposal of DG and non-DG equipment at national and local levels.

The Forest Service has received an extension to the current DG contract. Specifically, CPUS can be upgraded to calendar year 1994 and maintenance to 1998. These upgrades and maintenance contracts will be used to support the current level of computing capability as the Agency implements 615 technology.

The lifecycle management of all technology platforms will be important for technology planning and will have direct consequences on the implementation of various information systems throughout the Agency. Hence, planning, coordination, implementation, and disposal of various technology platforms should be closely tied to the development and management of information systems.

##### ☐ **Status**

Planned. Varies according to the technology platform. Until award and delivery of Project 615 equipment and software, DG equipment and PC's are the Agency's principal technology platform at most units.

##### ☐ **Actions**

1. Develop criteria and guidelines for lifecycle management of hardware, software, peripheral, and services.

2. Prepare Project 615 and telecommunication implementation schedule.
3. Coordinate and provide clearinghouse services, such as bulletin boards, for DG and other equipment.

☐ **Priority**  
High.

☐ **Related Activities**  
Technology 1, Crosscutting 2.

☐ **Related Documentation**

1. Program 615 Strategy (Blueprint), April 1992.
2. A Road Map of Forest Service Application Systems and Projects, July 18, 1993.
3. A-II Report for FY 95-99, Washington, DC, 1993.
4. Information Resource Management Plan FY 94-98.

### 3.8 Crosscutting Activities

#### Crosscutting 1

***Develop procedures to manage and track changes in Forest Service information resources.***

##### ☐ **Activity Statement**

Current Forest Service procedures are inadequate to manage or track changes in data, application, and technology environments. Change is normal and expected and if managed properly should have little or no impact on users. Changes in information system components can be attributed to changing business needs, new technologies, and user requirements. The Agency has a well-established process for managing change to technology but a change management process for applications and data is lacking. Because there is no consistent Servicewide approach, application and data changes are being managed both effectively and poorly. Changes sometimes are introduced without consideration of alternative approaches, user impacts, or impacts on other information system components. This results in high costs, unpredictable results, and dissatisfied users.

##### ☐ **Desired Results/Products**

The Forest Service should develop change management procedures for data (models, data base structures, and data), applications, and technology. Failing to do this could result in high IM costs and unpredictable results with respect to the Agency's information environment. These procedures should reflect the unique requirements of technology, data, and applications, and recognize the relationships between them. This process should result in changes that are:

- proactive (the change is anticipated),
- predictable (impacts of the change are understood),
- planned (a transition strategy is provided),
- communicated (all stakeholders are aware of what will happen),
- validated (change is validated by stakeholders), and
- productive (the transition of business in progress is smooth).

☐ **Status**

Initiated. IS&T is developing an interim directive on change management.

☐ **Actions**

1. Evaluate current change management practices in the Agency for possible improvements. Look at the Agency's current approach to technology change management as a potential model for the data and application change process.
2. Develop a comprehensive change management process for data, applications, technology and standards.
3. Prototype the change management process,
4. Update the appropriate FSMS and FSH'S,

☐ **Priority**

Critical.

☐ **Related Activities**

Data 2,3, and 4; Crosscutting 4; Skill 1.

☐ **Related Documentation**

1. Integrated Applications Project Report.
2. Region 9 Change Management Process.

## **Crosscutting 2**

### ***Migrate data, applications, and technology to 615 Environment.***

#### **□ Activity Statement**

The Forest Service is facing challenges related to the migration to the 615 technology environment and to the integrated information environment. Neither of these can be addressed without considering the other. The primary reasons for initiating a system migration are:

1. replacement of one or more systems with a set of coordinated applications and integrated data that fit within the corporate IM environment; and
2. moving an existing system to a new technology platform due to the replacement of the current platform.

Migration to the Forest Service integrated information environment has been underway since the approval of the Framework 1992, but it has not proceeded in a comprehensive, coordinated manner. Planning is underway for migration to the 615 environment, but separate from the migration to the integrated information environment. The actual technology migration should begin once the 615 contract is awarded. Both of these efforts will occur over the next several years and are highly dependent on each other. Some deterrents to these migration efforts are:

1. There is a lack of a Servicewide migration plan that integrates these two migration paths.
2. The amount of time and resources it takes to build applications and data bases to participate in the new integrated environment conflicts with immediate needs to build, fix, or convert systems.
3. Interagency requirements for some systems will make it difficult to integrate on a Servicewide basis.

A coordinated, cross-agency migration plan must be developed.



#### ☐ **Desired Results/Products**

A considerable amount of work has been done by the 615 Blueprint Application Functionality Data Migration, and Preparing Technology groups. The Fire and Aviation Management Staff (F&AM) also has done some analysis in this area. A comprehensive, Servicewide migration strategy is needed that builds on the work of these and other groups. This migration plan must tie together the 615 and IM migration paths, and address issues at both the national and local levels. The migration plan should cover issues such as:

- identification of applications to be migrated to 615 as is, applications to be reengineered, and applications that will not be migrated;
- schedule for migration;
- criteria for migrating applications and data to 615;
- criteria for migration to the integrated information environment;
- criteria for determining what needs to be integrated;
- migration timing and milestones;
- guidance for local units;
- phasing out of DG technology;
- guidance on developing applications for specific platforms. For example, if an application is currently under development, should it be designed for the DG, for 615, or both?
- conversion and data cleanup issues.

#### ☐ **Status**

Work is being done on application, technology and data migration as part of the 615 Blueprint. However these efforts are not directly tied to the reengineering efforts that are underway.

#### ☐ **Actions**

1. Integrate current migration efforts and expand scope to consider IMF implementation issues.

2. Develop national and local migration plans.
3. Identify responsible group to help manage and facilitate migration.

☐ **Priority**  
Critical.

☐ **Related Activities**  
Technology 1 and 2; Crosscutting 3; Skills 2 and 3.

☐ **Related Documentation**

1. Open System Environment Conference: Management Systems Directors Briefing, October 4- 1993.
2. F&AM Appraisal of Current Systems and Migration to the 615 Technology: February 14,1994.

### **Crosscutting 3**

#### ***Develop policies, standards, and procedures to address IM security.***

##### **❑ Activity Statement**

Security must be considered in all categories and at all levels of the Agency's IM environment. The three components of security are confidentiality, integrity, and availability. A risk analysis needs to be performed that measures the risk that the data will be corrupted, unavailable, or subjected to unwarranted access against the cost of the applied security. This cost needs to be measured primarily on the basis of lost productivity. The security system must demonstrate identification of the risk and demonstrate identification of the mitigation of that risk.

Implementing electronic security is dependent on the computer and network software used. It is essential to develop policies, standards, and procedures for ensuring system, data base, application, and data-level security in the new Forest Service information environment. This is especially important as more Privacy Act and other sensitive data are being stored electronically and as the Forest Service embraces an information-sharing environment and opens its systems to outside Agencies and customers.

There are serious security considerations associated with current, pending, and future legislation directing access to Forest Service data bases, equipment, and such by other Government Agencies and the general public. Many Forest Service customers no longer want the Agency to generate a report. Rather, they want direct access to the data to generate their own reports. Providing this increased access is critical but will pose numerous challenges.

##### **❑ Desired Results/Products**

A comprehensive security model must be developed to address the use of Forest Service systems with respect to the following:

- the type of data that is stored and levels of confidentiality and sensitivity;
- potential customers for the data and different levels of access to data;

- location of the data that is stored;
- how this data is to be maintained and shared;
- availability requirements for the data;
- integrity requirements for the data;
- how computer systems, networks, and data bases are to be managed to support an environment of sharing data; and
- demonstrating that the lost productivity caused by security measures is in line with the benefits derived from such measures.

Policies, standards, procedures, and software should be developed to manage security at the following levels:

- system access and privileges to perform SYSTEM level operations;
- data base access and privileges to perform data base level operations;
- application access and privileges to perform different business functions; and
- data access and privileges to manipulate and share the data.

#### ☐ **Status**

Phase 1 of the FSAE Project reflects a considerable amount of work on data base, application, and data security for the DG environment. Phase 2 of FSAE will look at these same issues in the client /server, distributed data base environment.

#### ☐ **Actions**

1. Commission an interdisciplinary team with expertise in IM, application development, data base management, systems and networking management, and 615 technology to analyze the Forest Service security requirements.
2. Develop a model of how data is to be stored, processed, and shared, and determine security requirements for this model. Ensure that the impact of the security does not outweigh its value.

3. Establish security policies, standards, and procedures and document them in the appropriate FSMS and FSHS.
4. Initiate projects to develop applications to support these standards and procedures.
5. Make contracting provisions so that “off-the-shelf” applications software includes security measures as outlined in the FSH and FSM.
6. Institutionalize security within the Forest Service by establishing security training as a regular part of the Agency’s IM training curriculum.

☐ **Priority**  
Critical.

☐ **Related Activities**  
Skills 2 and 3; Crosscutting 2; Technology 1 and 2.

☐ **Related Documentation**  
1. Security Handbook, ADH 6609.13  
2. OMB Circular A-130, Public Law 100-235, NIST Special Publication 500-172.

#### **Crosscutting 4**

##### ***Manage inventories of information resources.***

#### ☐ **Activity Statement**

The purpose of this activity is to document, define, and inventory all significant existing data bases, applications, communication equipment, technology platforms, and skills inventory within the Agency. This inventory will establish a baseline for all data, applications, and technology architecture planning for national and local needs. The need for an inventory that serves both national and local needs becomes critical as the complexity of the Agency's IM environment increases with mixed technology platforms, shortage of critical skills, and numerous data bases and applications that may be redundant and singular in purpose. Currently most of the information is scattered in numerous documents, separate data bases, spreadsheets, various repositories, and different hardware systems, making it difficult at both national and local levels to assess a baseline of the inventory without additional effort each time it is needed.

The data base and spatial information that need to be built to track this information should be designed with other focus areas in mind, and could be tied to purchase orders, property systems, personnel systems, and budgeting systems to minimize duplication of entry and provide a natural process of doing business. Information already tracked in a corporate repository should not be duplicated but enhanced by extending the repository over time to include items currently missing, or building linkages to other needed data bases, documents, and spatial information as part of consistent design and implementation that follows national guidelines and standards.

#### ☐ **Desired Results/Products**

An information resource catalog (IRC) as part of the FSIMR should be developed to:

- Facilitate a variety of upward reporting needs which are done separately such as the A-n report, IRM Plan, Roadmap Report, KEI Configuration Management Report, and numerous other documents that maintain and track data, application, and system information.
- Show the distribution of information resources throughout the Agency—where the applications and technology physically exist.

- Serve as a information locator where data exists.
- Use as a baseline as part of the FSIMR for long-range planning for data, application, and technology architectures. The information resource catalog may include:
  - a. application categories (including major uses of personal computers, locally defined applications, important spreadsheets, and analysis tools);
  - b. data (inputs, outputs, major files/data bases);
  - c. technology platforms (hardware, software, communications); and
  - d. skills inventory.
- Budget and track for cost-control decisions.
- Support ad hoc requests for information in the data base.

☐ **Status**

Initiated by Region 1. Should be evaluated and expanded to meet national needs.

☐ **Actions**

1. Determine the scope, objectives, and IRC workplan. Coordinate with the FSIMR.
2. Prepare for data collection using standardized forms.
3. Collect IRC data.
4. Enter data into an automated system.
5. Validate and review draft of the IRC.
6. Draw data flow schematics, matrixes, and spatial location plans.
7. Distribute throughout the Agency
8. Administer and maintain the IRC.

☐ **Priority**

Moderate. Development should begin as soon as possible and be completed before Project 615 technology is implemented.

☐ **Related Activities**

Data Management 2,3, and 4; Skill 1; Crosscutting 1.

☐ **Related Documentation**

None.



## Crosscutting 5

### ***Conduct pilot projects to evaluate critical IM issues.***

#### ☐ **Activity Statement**

There are a number of IM issues that are not well-understood within the Agency. Many of the current IM efforts are relatively new or have only recently been initiated, such as the DPD effort, AWSS Project, BPR, applying the FSIEM in its full life cycle, rapid prototyping in a CASE environment, expert systems, GIS, project 615, LAN in a large office such as the WO, challenges pertaining to the interoperability and interconnectivity with internal and external Agencies, Internet, multimedia, and document management.

In addition, due to the large and significant investment that Project 615 will require over the life of the contract, a pilot study is needed to examine the impact of this new technology on the Forest Service in the first year. Lessons learned from the pilot projects should be shared throughout the Agency.

#### ☐ **Desired Results/Products**

The following are examples of pilot activities,

- Guide Project 615 Pilot and understand potential effects on the organization. Due to the large and significant investment that Project 615 will require over the life of the contract, a pilot study is being undertaken on 27 pairs of sites to monitor 3 generic configurations. This will provide valuable field testing and lessons learned for incorporation into a configuration management plan. The configuration management plan will include hardware, software, data bases and network topologies, change management guidelines, responsibilities, and updates to the appropriate FSM'S and FSHS. An outside consulting firm (KEI) has been selected as part of a multiyear agreement to assist in both Project 615 pilot year and follow-on implementation activities. At this writing, 16 objectives have been identified for emphasis in the pilot year. The major emphasis for the first year is to specifically address congressional, GAO, and Agency concerns with respect to specific issues of GIS capability, locations and use, IM skills requirements, systems support, and other relevant activities dealing with a procurement of this size and complexity.

- Select several data base projects that have applied the FSIEM and bring to completion for field implementation. Without actual products that can be tested and validated by end users, the benefits of integrated IM will not be realized.

As the discussion above indicates, there are many opportunities for pilots over the next several years. All pilot activities need to be well-coordinated as part of the planning and learning process and lessons learned should be shared widely. Both formal and informal pilots need to be conducted throughout the IM spectrum.

☐ **Status**

Initiated. Selected pilot projects are already underway such as the 615 Pilot Year effort.

☐ **Actions**

1. Establish a process and criteria whereby opportunities for pilot projects can be identified and initiated. As projects are initiated, the scope, objectives, and progress should be communicated to the Agency.
2. Conduct pilots. For example, conduct the 615 Pilot Year effort and gather the necessary information to develop the configuration management plan needed for full implementation. Monitor field sites to report findings to congress. Coordinate the configuration management plan as part of the Agency's IM planning process in order to ensure successful implementation Servicewide.
3. Establish the means to communicate the results of the pilot projects and lessons learned. Ensure that pilot activities are not conducted in isolation, but that they lead to organizational learning and potential adoption.

☐ **Priority**

Critical.

☐ **Related Activities**

None.

**❑ Related Documentation**

1. Kajax Engineering, Preliminary Configuration Management Plan for Project 615, January 31,1994.

## **Crosscutting 6**

***Investigate and adopt new information technologies to support the Forest Service mission.***

### **❑ Activity Statement**

As the Forest Service becomes more effective and efficient at serving customers and putting into practice ecosystem management, technology and information systems will play an increasingly important support role. As a result, new possibilities and advancements in technology and methods should be monitored closely for possible cost savings or benefits to the organization. As part of the traditional business need for technology or as part of reinvention and BPR, the Agency must evaluate, test, and deploy, as needed, the tools and methods that are currently available.

The current emphasis of the 615 contract is on GIS and traditional office automation software in a graphical client/server environment. Several additional technologies have been identified for study. These include statistical software, CAD, image processing/remote sensing, and support services that may be added after the initial award. As the Agency looks to the future, it may seek emerging technologies and methods such as multimedia, video teleconferencing, document image processing, CASE application software, compact discs, configuration management software, document and records management systems, analytical software, decision support software, knowledge-based systems, object-oriented programming languages, 3-D interactive visualization hardware/ software, and technology and software advances for the disabled users.

### **❑ Desired Results/Products**

Coordinate and evaluate the adoption and implementation of critical new technology insertions for the Agency over the next 5 to 8 years. This will become one of the critical roles that IS&T, in partnership with others, can play in helping the Forest Service apply technology and disciplined practices to improve effectiveness and efficiency in meeting business objectives.

This is an activity which includes hardware, software, and innovative methods. The Agency can benefit greatly from an enthusiastic champion or team interested in keeping abreast of changes in technology and in helping the Agency gain the greatest benefit at the least overall cost in meeting its business objectives. New developments must be discussed and shared widely as the selection of these tools will determine the success or failure of the

Agency's business task by the people who must apply them. Past deployment of major software with no clear plan of deployment, evaluation, and testing has produced mixed results and has had major impacts on organizational effectiveness.

☐ **Status**

Initiated in varying form as pilot justifications throughout the Forest Service.

☐ **Actions**

1. Establish a study plan of critical new technologies for maximized benefits to the Forest Service.
2. Develop criteria for evaluating and selecting new technologies.
3. Establish subject-matter experts and teams to evaluate and test new technologies and establish guidelines and standards.
4. Develop budgeting and resource requirements plans and implementation schedules.
5. Adopt and train work force for maximum benefit of the new technology or method.

☐ **Priority**

Moderate, but varies according to need and urgency.

☐ **Related Activities**

Technology 3; Crosscutting 6.

☐ **Related Documentation**

None.

## Section 4 Maintaining the Implementation Master Plan

***“It is a bad plan that admits to no modification.”***

Publius Syrus  
*Moral Sayings*

This section describes the process for establishing and maintaining the IMP. Any plan, once accepted, must be implemented, monitored, and revised as necessary. The IMP is intended to be flexible to reflect changing business priorities and needs. It will be revised periodically at a minimum, annually.

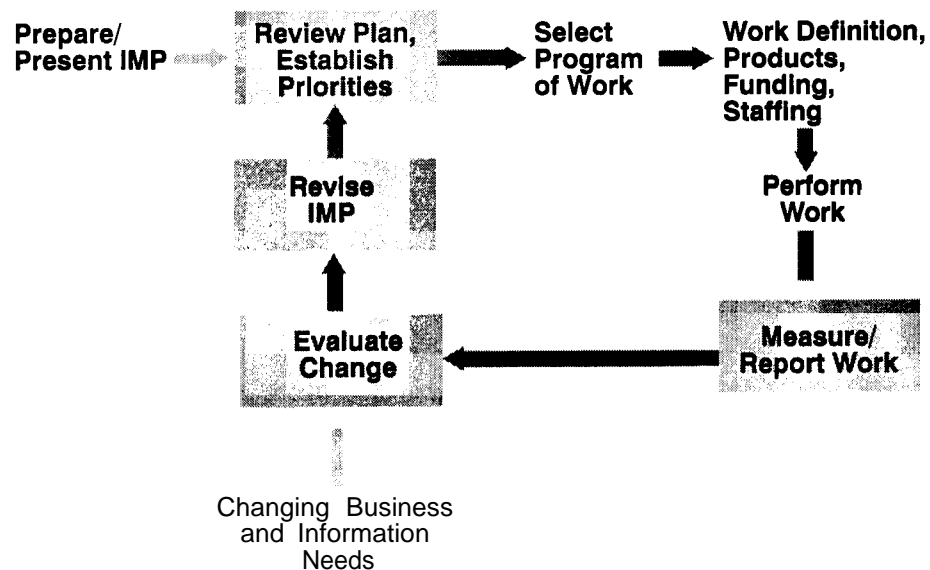


Figure 4.1 shows the general management model for nationally important IM activities. The four steps that constitute maintaining the IMP are shown in boxes. A more complete discussion of the IM model follows.

### ***Prepare and Present IMP***

As described in this document, the IMP was commissioned by the CIO to implement the IM Framework. A team developed the IMP and proposed activities and priorities to accomplish IM goals.

### ***Review Plan and Establish Priorities***

The CIO provides leadership by facilitating and coordinating IM activities in the Forest Service. Counseled by the IMAG and seeking input from interested parties, the CIO reviews the IMP, validates identified activities to achieve IM goals, and establishes priorities. The highest priority activities are formulated into budget alternatives to be presented to the Chief and Staff.

In each cycle of the IMP, the CIO identifies the activities that need origination or continued support. The Forest Service IM 3-Year Tactical Plan (see Section 3, Management Activity 4) incorporates the results of analysis of these selected activities wherein requirements, staffing, resources, and overall costs are estimated. Budget alternatives are prepared for various funding levels for consideration by the Chief and Staff.

### ***Select Program of Work***

Chief and Staff consider the proposed national IM program along with all other Forest Service programs, and select or modify a funding alternative.

### ***Work Definition, Products, Funding, and Staffing***

The CIO, working with interested parties, facilitates the selection of information activity sponsors. The activity sponsor(s) then commission a work team with a clearly defined scope, objectives, products, major milestones, and completion date. Funding for staffing and resources is acquired as provided by the Chief and Staff (see Section 3, Management Activity 3).

### ***Perform the Work***

Sponsors are responsible for ensuring a project is completed as planned and on schedule; that people, funds and other resources are made available; and that necessary IM roles are filled. They schedule, coordinate, facilitate, and manage the costs of and the resources required to accomplish the project.

### ***Measure and Report Work***

While the work is being accomplished, quality and progress measurements are necessary to assess the status of the project and to update and coordinate the IMP and other plans. Sponsors must provide information periodically to the CIO on the accomplishment, funding, IM issues, changes needed, and quality of support of the information activity. The CIO will provide standards and maintain this information in an electronic media suitable for monitoring by interested parties. Sponsors' reports will be primary information for maintaining the 3-Year Tactical Plan.

### ***Changing Business, and Information Needs***

As the need for change is identified, priorities and activities will have to be adjusted. Any change in the business may require modification of the Agency's business models and/or focus area definitions. Proposals to add or change activities can be introduced. Adjustments to timeliness, activity products, and completion dates can be submitted. This step of the IM model provides the entry point for inserting and documenting changes needed within the IMP revision cycle.

### ***Evaluate Change***

Change occurs not just from the changing business and information needs mentioned in the previous step, but also through the completion of the information activities identified in the IMP.

The CIO, in conjunction with IMAG and interested parties, strategically evaluates accomplished and proposed changes to answer the question, "Are we on track in achieving our IM goals?" They give new guidelines for activity analysis and prioritization if needed. They also determine if adjustments are needed in the current IMP process itself. Finally, in this step, the effort and timing required to revise the IMP is considered and planned.

### ***Revise IMP***

The CIO is responsible for updating the IMP as needed, utilizing the WO IS&T Staff or a special team put together for that purpose. The process and guidelines for activity analysis and prioritization are documented and applied. Upon completion of this step, the management cycle starts again with a revised IMP, proposing new or changed IM activities and priorities.



## Implications of the Proposed General IM Model

The discussion of the management model presented here has focused primarily on the use and maintenance of the IMP. The larger national IM model that covers all national IM efforts will be addressed more fully in Management Activities 2-4. Local IM activities are not addressed directly in this section, but clearly must be coordinated with and support the national IM model.

## Appendix A: Acronyms and Glossary

### Acronyms

ALP:	Automated Lands Project
AMS:	Asset Management Project
AWSS:	Agency-Wide Strategy Stage
BPR:	Business Process Reengineering
BPI:	Business Process Improvement
CIO:	Chief Information Officer
CMS:	Contact Management System
DPD:	District Production Database
FA:	Focus Area
FASS:	Focus Area Strategy Stage
FIRMR	Federal Information Resource Management Regulations
FS:	Forest Service
FSAE:	Forest Service Application Environment
FSIA:	Forest Service Information Architecture
FSIEM:	Forest Service Information Engineering Methodology
FSH:	Forest Service Handbook
FSIMR:	Forest Service Information Management Repository
FSM:	Forest Service Manual
GIS:	Geographical Information System
IAP:	Integrated Applications Project
IM:	Information Management
IMAG:	Information Management Advisory Group
IMEC:	Information Management Education Consortium
IMF:	Information Management: A Framework for the Future
INA:	Information Needs Assessment
INFRA:	Infrastructure
IRM:	Information Resource Management
IS&T	Washington Office, Information Management and Technology Staff
LAN:	Local Area Network
MAN:	Municipal Area Network
MFA:	Money Focus Area
MS	Management Systems (Regions, Stations, and Area)
NFC:	National Finance Center
NIST	National Institute of Standards and Technology
NTIA:	National Telecommunication Information Agency
OIRM:	Office of Information Resource Management, USDA
OMB:	Office of Management and Budget
RMAP:	Resource Management Application Project
RMIP:	Resource Management Information Project
RPA:	Forest and Range Renewable Resources Planning Act of 1974
WAN	Wide Area Network

## Glossary

### **Agency-Wide Strategy Stage (AWSS)**

The highest level strategic analysis of the Agency required by the Forest Service Information Methodology that was adopted as a result of the “Information Management: A Framework for the Future” report. This stage documents business activities and information needs and how they are interrelated, and identifies opportunities for coordinating and sharing data and development efforts, as well as opportunities for redesigning or otherwise improving Forest Service activities.

### **Application**

A set or logical grouping of automated and related manual procedures that supports one or more business processes and information needs.

### **Business**

The work, program, or activity associated with carrying out the mission of the Agency.

### **Business Function**

What a business does or needs to do, irrespective of how it does it.

### **Business Model**

A model or collection of models representing a particular business. Components include models of objectives, functions, information, and technology.

### **Business Process Reengineering**

The fundamental rethinking and radical redesign of an entire business system—the business processes, organizational structures, management systems, values, and beliefs necessary to achieve dramatic improvements in critical measures of performance.

### **Business Rules**

Standard business practices that impose criteria or constraints on use of the data. Business rules provide the context needed to use the information. Many business rules are captured in the data model, while others must be described explicitly outside the data model in text form.

**CASE\*Method**

A structured approach to engineering systems in a data processing environment that consists of a set of stages, tasks, deliverables, and techniques that provide guidance through all steps in the life cycle of a system. CASE\*Method is a proprietary product of the Oracle Corporation. It is the basis for the FSIEM.

**Chief Information Officer (CIO)**

The senior executive service position responsible for leading and facilitating the Agency's move to an integrated data and information environment. The CIO supervises functions performed by the WO IS&T Staff, and reports through the Deputy Chief for Administration.

**Corporate**

Consistent and shared applications, data, technology, standards, and practices intended for either local or Servicewide use.

**Critical Success Factor**

Any business event, dependency deliverable, or other factor which, if not attained, would seriously impair the likelihood of achieving a business objective.

**Data Administration**

The policies, procedures, and organizational responsibilities for managing the definition, security, access, and maintenance of data. Data administration ensures that the data collected and maintained within an organization is structured, defined, and stored in such a manner that is accessible and understandable to all segments of the organization that have a legitimate interest in the information.

**Data Communications**

The science and technology of electronically transmitting data between terminals and computers or between computers via any communications facility. This includes Federal or commercial line service, value-added network (VAN) service, line conditioning, modems, multiplexors, and concentrators.

**Data Base Administration**

The implementation of data administration policies and standards as they apply to how, where, and in what manner data are stored, maintained, and accessed. It includes the policy, procedures, and organizational responsibility for performing various tasks related to data base management such as installing software, managing access to the data base, performing backups, and tuning for performance.

**Data Base Management System**

An automated collection of software that provides a means to store related data with controlled redundancy in data base(s) serving one or more applications. Data are stored independently of programs that use the data. A common and controlled approach is used to add new data and to modify and retrieve existing data.

**Data Model**

A structured representation of an organization's information. It includes entities, attributes, and relationships.

**Data Standards**

Data standards define how facts are to be referred to, how they are to be represented, what they will mean, and rules governing their use throughout the Agency.

**Data Steward**

The person responsible for the accuracy, availability, maintenance, and distribution of data stored in all or some portion of a data base table. This person should be an expert in the data standards for his or her assigned data items and thus can be a subject matter expert. This can also refer to an organization or position with the same responsibilities.

**Desired Future Condition**

The conditions that are expected to result if goals and objectives are fully achieved.

**Distributed Processing**

Local and remote processing of data at both central and distributed facilities via a network of computers, data communications lines, and terminals that permits the use of more than one of the facilities in the network to accomplish processing requirements.

#### Ecosystem Management

Use of an ecological approach to achieve the multiple use of national forest values in such a way that national forests and grasslands represent diverse, healthy productive, and sustainable ecosystems.

#### Enterprise **Model**

A high-level, conceptual model that describes the Forest Service's information requirements and business functions. This model is produced in the AWSS of the FSIEM, and includes the function hierarchy entity relationship model, and function entity matrix. At the Focus Area Strategy Stage (FASS) and analysis stages, more detailed information is added to relevant portions of the enterprise model.

#### **Entity**

A thing of significance, whether real or imagined, about which information needs to be known or held; an item (such as a person, place, or thing) about which information should be obtained and stored.

#### **Entity Model**

The entity model is made up of the entity relationship diagram and its associated definitions and matrix analyses. It provides a comprehensive picture of the data required by an organization. An entity model is sometimes referred to as a data model.

#### **Entity Relationship Diagram**

A diagram that pictorially represents some part of an organization's data model by showing the entities and the business relationships between them.

#### **Focus Area**

A cohesive subset of the Agency's business and information needs. Defined during the AWSS, focus areas are described by referring to relevant portions of any or all parts of the enterprise model. Examples of focus areas are people, money, and infrastructure.

#### **Focus Area Strategy Stage (FASS)**

The stage at which a focus area is explored in more detail and the boundaries, scope, and priorities of a coordinated set of information management and potential development efforts are identified.

**Forest Service Application Environment (FASE)**

A set of software, standards, policies, and procedures designed to help system developers provide and users take advantage of common ways to access and use Oracle-based applications on the DG. It also can be used to access non-CEO applications on the DG in lieu of using IS (“IS” is Forest Service-built software that allows DG users to access the non-CEO environment such as CLI in a CEO-like environment).

**Forest Service Information Architecture (FSIA)**

Originally conceived a number of years ago and endorsed by the IMF Report, the FSIA is based on a set of principles that guides implementation and use of technology in the Agency. Examples of software that support FSIA principles include Access Management (AM), Information Structure (IS), and Information Centers (IC).

**Forest Service Information Atlas**

An automated repository for specifics related to Forest Service information resources, and a source for data standards for widely used categories of data and for information about Oracle applications approved for national distribution.

**Forest Service Information Engineering Methodology (FSIEM)**

The structured approach adopted by the Forest Service to support information system development. A unified system of methods, standards, and techniques that provides structure and support for planning, developing, and operating the Agency’s information system, including data, processes, and technology of that system. The methodology is based in large part on the stages, tasks, and deliverables of Oracle’s CASE\*Method.

**Forest Service Information Management Repository (FSIMR)**

As an inventory of Forest Service information resources, the FSIMR contains descriptions of those assets, how they are related to each other, and how they support the Agency’s mission. Information assets include data important to the Forest Service and the technology used to create, store, access, and use such data. The FSIMR stores and integrates information about Forest Service business functions, data, and software, and is supported by tools that allow for the input, management, analysis, and display of the inventory contents.

**Geographic Information System (GIS)**

An information processing technology used to input, store, manipulate, analyze, and display information about geographic features.

**Information**

Data that has been processed and interpreted. A majority of data evolves to information, which may in turn become data for a subsequent generation of information. It can be any communication or representation of knowledge such as facts, data, or options in any medium or form, including textual, numerical, graphic, cartographic, narrative, or audiovisual.

**Information Engineering (IE)**

The application of an interlocking set of principles, practices, and techniques for the planning, development, and operation of an information system in a shared information environment. IE addresses the needs and goals of an organization as a whole, as opposed



**Information Needs Assessment (INA)**

A process through which a management team identifies the types of information it needs to accomplish its mission, and the types of data needed to support that information. INA's are used as tools to identify the data and information necessary to support resource management decisions, and the best methods of collecting and maintaining resource data and displaying needed information.

**Information Resource Management (IRM)**

The management of the resources necessary to acquire and maintain the information needed by the organization to accomplish its mission. These resources include but are not limited to human resources (such as people, organizational structures, and training), hardware, software, and contracts. An IRM Plan is completed each year to determine what resources are needed for the following 5 fiscal years.

**Information Structure**

A Forest Service-developed application that allows managing and sharing of non-CEO information within and with other DG computers using a CEO-like structure. It is part of the collection of applications that supports FSIA principles.

**Integrated Application**

An application designed to share data, screens, or behind-the-screen code with at least one other application.

**Integrated Data Base**

A data base environment where data base objects and data work as a unified whole and are available to all applications that require their use.

**Integrated Information Environment**

The set of approaches, tools, and products that makes up an environment in which information is managed to achieve a high level of sharing among systems and data.

**Life-Cycle Management**

The process for administering an information system for the identification of a need through its replacement, obsolescence, or termination,

**Lineage**

The source, validity and history of data values.

**Local Area Network (LAN)**

A nonpublic telecommunications system, within a limited geographic area, that is usually restricted to a building or cluster of buildings and is designed to allow a number of independent devices to communicate with each other over a common transmission-interconnection topology.

**Metropolitan Area Network (MAN)**

A loosely defined term generally understood to describe a network covering an area larger than a LAN. It typically interconnects two or more LAN's, may operate at higher speeds, cross administrative boundaries, and use multiple access methods.

**Metadata**

Data about data values and data structures; it is stored in the FSIMR.

**Model**

A representation of something for the purposes of displaying, analyzing, or gaining understanding. It can be descriptive (words), graphic (pictures), or physical. Models may be used to convey or represent different perspectives (user versus designer, for example).

**Module**

A program or procedure that implements one or more business functions, or parts of business functions, within an application. A software component that implements one or more business functions.

**Network**

An interconnecting network of computers.

**Oracle**

The commercial data base management system and its supporting set of tools currently used by the Forest Service for its corporate data base management system.

**Organization**

A corporation, Government Agency, staff, branch, non-profit group, or other assembly of people that has an identity, was formed for a purpose, and can act as a unit. It may have zero or more members and may exist for any duration.

**Project 615**

The procurement of new software and hardware technologies to replace the office, scientific, and administrative functions now provided by DG systems to facilitate storage, retrieval, analysis, and presentation of spatial information.

**Relational Data Base**

A data base in which data are organized into one or more relationships that can be manipulated based on relationships between the data.

**Repository**

The FSIMR is an inventory of the Agency's information assets. The Repository contains descriptions of those assets, how they are related to each other, and how they support the Agency's mission. Information assets include the data important to the Forest Service and the technology used to create, store, access, and use the data. The repository stores and integrates information about Forest Service business functions, data, and software. The FSIMR is supported by tools that allow for the input, management, analysis, and display of the inventory contents, such as Case\*Dictionary.

**Role**

The part an individual, position, or organization plays in carrying some part of an organization's business.

**Security Plan**

A plan based upon a risk analysis that describes the assessment of the risk analysis report, safeguards for facility, data, and software protection, controls, procedures, and contingency plans.

**Shared Data**

Data shared between users or business functions. Does not necessarily mean a single, organizationwide data base.

**Software**

Computer programs, rules, processes, documentation, and such that are used to collect, store, analyze, and present information.

**Spatial Data**

Data describing characteristics or facts both descriptively and positionally with respect to some coordinate reference system.

**Sponsor**

The organization, position, or person responsible for, and whose mission or self-interest is served by, a particular information activity. A sponsor normally provides resources (but not exclusively. Other stakeholders may provide resources if they want to have an active role in the information activity) to accomplish an information activity.

**Stage**

One of seven major parts of the FSIEM.

**Steward**

The person or group assigned responsibility for developing and maintaining one or more information assets of the Forest Service.

**Stakeholder**

Any person or position with an interest in an IM activity and who would be affected by that activity.

**System**

A collection of interrelated programs, equipment, people, or machines and processes.

**Systems Analysis**

An approach to problem solving where the total system is considered before focusing on individual parts of the system.

**Systems Programming**

The development of software used in the management and control of computer systems or networks. Generally operates at a level below business application software.

**Table**

A tabular view of data consisting of columns and rows used in relational data bases. Tables are logical views as opposed to physical data structures.

**Telecommunications**

**The** science and technology of communication via electronic transmission of information. Telecommunications service generally includes the transmission, emission, or reception of signals, writing, images, sounds, or intelligence of any nature by wire, radio, or other electrical means. Telecommunications facilities include equipment used for such modes of transmission as telephone, telegraph, teletypewriter, data, facsimile, telephotograph, video, and audio; and such corollary items as distribution systems and communications security facilities.

**Very High Frequency (VHF)**

Frequencies from 30 MHz to 300 MHz.

**Wide Area Network (WAN)**

A physical or logical network that provides capabilities for a number of independent devices to communicate with each other over a common transmission interconnected topology in geographical areas larger than those served by LAN's.

### I. Publications and Speeches

- Barker, Richard, 1990. *CASE\*Method: Entity Relationship Modeling*, Addison-Wesley Reading, MA.
- Barker, Richard, 1990. *CASE\*Method: Tasks and Deliverables*, Addison-Wesley Reading, MA.
- Barker, Richard and Cliff Longman, 1992. *CASE\*Method: Function and Process Modeling*, Addison-Wesley Reading, MA.
- Brown, James H. and James Martin, 1993. *Enterprise Engineering-Building 21st Century Organizations, Creating a New Human/Technology Partnership*.
- Coleman, D. S., et al., 1989. *Information Engineering Management Guide*, Pacific Information Management, Inc., Culver City CA.
- Farnham, Alan. "Making High Tech Work for You," *Fortune*, Autumn 1993.
- Fites, Philip and Martin P.J. Kratz, 1993. *Information Systems Security: A Practitioner's Reference*, Van Nostrand Reinhold, New York, NY.
- Inmon, W.H., 1990. *Oracle, To Build Decision Support Systems*, QED Technical Publishing, Wellesley MA.
- Inmon, W.H., 1991. *Developing Client/Server Applications*, QED Technical Publishing, Wellesley, MA.
- Nolan, Richard L., "Managing the Crisis in Data Processing," *Harvard Business Review*, March-April 1979.
- Parker, Marilyn M. and Robert J. Benson. "Strategic Planning Methodology: Enterprise-wide Information Management," Summer 1990.
- Seibert, Graham H., 1993. *Oracle Data Processing: A Managers Handbook*, Windcrest /McGraw-Hill, Blue Ridge Summit, PA.
- Semich, J. William. "Here's How to Quantify IT Investment Benefits," *Datamation*, January 7, 1994.
- Smith, William G., 1991. *Information Resource Management Policies*, Database Research Group.
- Smith, William G., 1991. *IRM Organizational Model*, Database Research Group,

Spewak, Steven H. and Steven C. Hill, 1992. *Enterprise Architecture Planning*, QED Publishing Group, Wellesley MA.

Tapscott, Don and Art Caston, 1993. *Paradigm Shift, The New Promise of Information Technology*, McGraw-Hill, New York, NY.

Tapscott, Don and Art Caston, "Paradigm Shift: How Information Technology is Reinventing the Enterprise," *Business Week*, October 25, 1993.

Oracle Corporation, 1993. *Administer the CASE Tools (Version 5.0)*, Oracle Corporation, Redwood Shores, CA.

## II. Forest Service Manuals and Handbooks

FSM 1100	<i>Directive System</i>
FSM 6600	<i>Systems Management</i>
FSM 6610	<i>Computer Technology Management</i>
FSM 6620	<i>Computer Software Management</i>
FSM 6640	<i>Telecommunications</i>
FSH 1109.12	<i>Directive Preparation</i>
FSH 6609.11	<i>System Management Handbook</i>
FSH 6609.12	<i>ADP Technical Handbook</i>
FSH 6609.13	<i>Application Developer's Handbook</i>
FSH 6609.14	<i>Telecommunications Handbook</i>
FSH 6609.15	<i>Standards for Data and Data Structures Handbook</i>
FSH 6609.32	<i>ADP Security Manual</i>
FSH 1309.14	<i>Information Requirements Handbook</i>
FSH 1309.15	<i>Electronic Office Handbook</i>

## III. Forest Service and Other Agency Publications

USDA Forest Service. *A-II IRM/ITS Report, FY 95-99*, U.S. Department of Agriculture, Washington, DC, 1993.

USDA Forest Service. *Assessment of the Current Information Environment*, U.S. Department of Agriculture, Washington, DC, November 1993.

USDA Forest Service. "Appendixes," *Assessment of the Current Information Environment*, U.S. Department of Agriculture, Washington, DC, November 1993.

USDA Forest Service. *Automated Lands Project (ALP) Strategy Report*, U.S. Department of Agriculture, Washington, DC, March 1993.

USDA Forest Service, **Region 6**. *Automated Lands Project Strategy Report*, U.S. Department of Agriculture, May 1993.

- Barriers and Solutions to Interagency Collaboration*, (from President's Forest Conference), April 2, 1993.
- USDA Forest Service. Eastern Region, Ranger District /Laboratory Field Offices. *Business Management. Automation/integration*, U.S. Department of Agriculture, Washington, DC, October 1988.
- Office of Management and Budget. *Circular A-11*, 1992.
- USDA Forest Service. Administration Deputy Area. *Continuously Improving Our Work Environment*, U.S. Department of Agriculture, Washington, DC, October 1993.
- Corporate Information Management—Process Improvement Methodology for DoD Functional Managers*, D. Appleton Co., Inc., January 1993.
- Gore, Albert. "Creating a Government that Works Better and Costs Less," *Report of the National Performance Review*, September 7, 1993.
- Harwood, Peggy. *Documenting Forest Service and Soil Conservation Service Coordination of Natural Resources and Environment Data and Information*, January 1994.
- USDA Forest Service, Information Management Education Consortium, 1994. *Education Guide for Information Management Skill Path Development*, U.S. Department of Agriculture, Washington, DC.
- Office of Management and Budget. *FEDSIM IRM Strategic Planning Guide*, Washington, DC, December 1993.
- USDA Forest Service. *Fire and Aviation Management: Information Management Strategy Project*, U.S. Department of Agriculture, Washington, DC, September 1992.
- USDA Forest Service. *Forest Ecosystem Management: An Ecological, Economic, and Social Assessment*, Report of the Forest Ecosystem Management Assessment Team, U.S. Department of Agriculture, Washington, DC, July 1993.
- USDA Forest Service. *Forest-Level Information Processing System (FLIPS)*, U.S. Department of Agriculture, Washington, DC, January 1987.
- USDA Forest Service. *Forest Service Agency-Wide Strategy Stage (AWSS Report)*, U.S. Department of Agriculture, Washington, DC, December 1993.
- USDA Forest Service. *From Promises to Performance—WO Activities Contributing to Implementation of the 1990 RPA Program*, U.S. Department of Agriculture, Washington, DC, June 1992.



- USDA Office of Information Resources Management. *The Future of Information Resource Management in the United States Department of Agriculture*, U.S. Department of Agriculture, Washington, DC, May 1988.
- USDA Forest Service. *GLS Evaluation Report*, U.S. Department of Agriculture, Washington, DC, March 1992.
- Geographic Information Systems Work Group. *Report to the Secretary*, U.S. Department of Agriculture, Washington, DC, February 1991.
- U.S. Congress. *Government Performance and Results Act of 1993*, Washington, DC, June 1993.
- Office of General Counsel–Natural Resources Department. *Hierarchy of Legal Authorities Applicable to Forest Service*, Washington, DC, April 1987.
- USDA Forest Service. *Information Management Resources Management Plan, FY 90-FY 95*, USDA Forest Service, Portland, OR, October 1990.
- USDA Forest Service. *Information Management Support Structure Report*, U.S. Department of Agriculture, Washington, DC, August 1993.
- USDA Forest Service. *Information Resource Management Plan, FY 94-98*, U.S. Department of Agriculture, Washington, DC.
- USDA Forest Service. *Information Management: A Framework for the Future*, U.S. Department of Agriculture, Washington, DC, February 1992.
- USDA Forest Service. *information Resource Management, A Vision of Information Resource Management in the Forest Service*, U.S. Department of Agriculture, Washington, DC, July 1990.
- USDA Forest Service. *integrated Information Management Program: 615 Strategy (Blueprint)*, U.S. Department of Agriculture, Washington, DC, April 1992.
- Internal Revenue Service. *IRS Design Master Plan*, Internal Revenue Service, Washington, DC, September 1993.
- Oaths, Ron. *MOU for Inter-Organization Resource Information Management (in support of the President's Forest Plan)*, USDA Forest Service, Region 6, 1994.
- U.S. Department of Commerce. *Manual for Data Administration*, Judith J. Newton and Daniel C. Wahl (eds.), U.S. Department of Commerce, Washington, DC, March 1993.
- USDA Forest Service. *Information Engineering Methodology* (a.k.a. Methodology Consensus Report), U.S. Department of Agriculture, Washington, DC, March 1992.

*NPIC Information System, Volume 1- Architecture Definition*, National Photographic Interpretation Center, December 1991.

USDA Forest Service. *National Geographic Information Structure*, U.S. Department of Agriculture, Washington, DC, January 1991.

USDA Forest Service. *National GIS Guidebook*, U.S. Department of Agriculture, Washington, DC, January 1994.

USDA Forest Service. *National GIS Plan*, U.S. Department of Agriculture, Washington, DC, May 1988.

USDA Forest Service, InS Staff. *National Software Approval and Distribution Process*, U.S. Department of Agriculture, Washington, DC, August 1993.

USDA Forest Service. *National Strategic Telecommunications Plan*, U.S. Department of Agriculture, Washington, DC, February 1994.

USDA Forest Service and Soil Conservation Service. *Natural Resources & Environment—Administration Reorganization Concepts*, U.S. Department of Agriculture, Washington, DC, 1993.

Office of Management and Budget. *Management of Federal information Services*, OMB Circular No. A-130, Office of Management and Budget, Washington, DC, June 25, 1993.

USDA Forest Service. *Open System Environment Conference: Management Systems Directors Briefing*, USDA Forest Service, Missoula, MT, October, 1993.

Pacific Northwest Region/Station Project 615 Action Plan - Updated, 1994.

Project 615 Implementation Plan for the USDA Forest Service, KEI, 1994.

USDA Forest Service, Aviation Management. *Project 6-7-9: Transition to the Information Management Environment*, U.S. Department of Agriculture, Washington, DC, December 1993.

USDA Forest Service. *Q&A's from FS Reform Hearing*, briefing paper, U.S. Department of Agriculture, Washington, DC, February 1994.

USDA Forest Service. *Repository Team Report*, U.S. Department of Agriculture, Washington, DC, October 1992.

Request for Proposal (RFP), FEDCAC Project 107, Forest Service 615, General Services Administration, Falls Church, VA, October 1992.

*A Road Map of Forest Service Application Systems and Projects*, USDA Forest Service, Washington, DC, July 1993.

*NPIC Information System, Volume 1- Architecture Definition*, National Photographic Interpretation Center, December 1991.

USDA Forest Service. *National Geographic Information Structure*, U.S. Department of Agriculture, Washington, DC, January 1991.

USDA Forest Service. *National GIS Guidebook*, U.S. Department of Agriculture, Washington, DC, January 1994.

USDA Forest Service. *National GIS Plan*, U.S. Department of Agriculture, Washington, DC, May 1988.

USDA Forest Service, InS Staff. *National Software Approval and Distribution Process*, U.S. Department of Agriculture, Washington, DC, August 1993.

USDA Forest Service. *National Strategic Telecommunications Plan*, U.S. Department of Agriculture, Washington, DC, February 1994.

USDA Forest Service and Soil Conservation Service. *Natural Resources & Environment—Administration Reorganization Concepts*, U.S. Department of Agriculture, Washington, DC, 1993.

Office of Management and Budget. *Management of Federal information Services*, OMB Circular No. A-130, Office of Management and Budget, Washington, DC, June 25, 1993.

USDA Forest Service. *Open System Environment Conference: Management Systems Directors Briefing*, USDA Forest Service, Missoula, MT, October, 1993.

Pacific Northwest Region/Station Project 615 Action Plan - Updated, 1994.

Project 615 Implementation Plan for the USDA Forest Service, KEI, 1994.

USDA Forest Service, Aviation Management. *Project 6-7-9: Transition to the Information Management Environment*, U.S. Department of Agriculture, Washington, DC, December 1993.

USDA Forest Service. *Q&A's from FS Reform Hearing*, briefing paper, U.S. Department of Agriculture, Washington, DC, February 1994.

USDA Forest Service. *Repository Team Report*, U.S. Department of Agriculture, Washington, DC, October 1992.

Request for Proposal (RFP), FEDCAC Project 107, Forest Service 615, General Services Administration, Falls Church, VA, October 1992.

*A Road Map of Forest Service Application Systems and Projects*, USDA Forest Service, Washington, DC, July 1993.

Strategic Telecommunications Plan, U.S. Department of Agriculture, Washington, DC, September 1993.

*Supplernental A-11 JRM/ITS Report*, IS&T Staff, USDA Forest Service, Washington, DC, 1993.

*Systems Management: Systems Development Action Planning Team Report (SDAPT)*, USDA Forest Service, December 1975.

*USDA IRM Strategic Plan*, OIRM, USDA, January 1993.

*USDA Management Report for 1987*, USDA.

*Work Environment Task Force Report*, USDA Forest Service, Washington, DC, October 1993.

*Work Force 1995- Strength Through Diversity*, FS Personnel and Civil Rights Staff, USDA Forest Service, Washington, DC, December 1987.

#### **IV. Correspondence and Presentation Papers**

A Quality Exhibitor Opportunity Briefing. Federal Quality Institute.

IM in the Department, Slide Presentation, March 31, 1993, Dave Skeen, OIRM.

IRM Planning Briefing, Jan. 1994, Barbara LaCour, OIRM.

IRM Planning for FY 93, Jan. 29,1993, signed by John L. Okay OIRM.

IRM Planning for FY 95-99, Dec. 16, 1993, signed by John L. Okay OIRM.

Money Focus Area Briefing, Jan. 18, 1994, J.J. Maurer, Oracle Corp.

Information Requirements Analysis and Planning Presentation, Feb. 1,1994, LAI.

Information Strategic Planning The Cornerstone for Managing Change, Feb. 18, 1994, Dave Skeen, Associate Director, OIRM.

New Directions for the Forest Service. Presentation to Congress, Feb. 1994, Jack Ward Thomas, Chief, USDA Forest Service, Washington, DC.

Notes from the President's Forest Conference, April 2,1993.

Reply to 1390: Regional Leadership Team Meeting of 2/09/93. Project 615 Implementation Decisions-R2, February 3, 1993.

Reply to 1390/6600: Supplemental A-11 IRM/ITS Report (Exhibits 43A and 43B).

Reply to 6600: Assessment of the Current Information Environment (Appendix to the AWSS), Nov. 5, 1993.

Reinventing Government, Slide Presentation, Jan. 25, 1994, Joyce Jarrett-Thor, Federal Quality Institute.

Training Package for GPRA Performance Plan Coordinators, 1994, Cliff Hickman.